MANUAL TRAINING MAGAZINE

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MANUAL TRAINING MAGAZINE

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DIFFERENCES AMONG VARYING GROUPS OF CHILDREN SHOULD BE RECOGNIZED; AND THE PERIOD AT WHICH THIS RECOGNITION TAKES PLACE MAY RATIONALLY CONSTITUTE THE BEGINNINGS OF SECONDARY EDUCATION.[1]

DAVID S. SNEDDEN.

IN this discussion we assume (a) that American education aims to be democratic; that it therefore (b) seeks to give, within their personal and social capacity, equal opportunities to all; and that (c) quality of opportunity can only be secured by recognition of difference which, theoretically individual, may nevertheless, for practical purposes, be regarded as characterizing distinguishable groups of children. In addition, the writer makes the following assumptions: (a) The weakest part of American education, for many children, is that covering approximately the period from twelve to sixteen years of age—the last two grades of the elementary school, and first two of the high school. (b) The fixing of the elementary school period as eight years in length is not rationally defensible, but is one of the incidents of the development of American public education from below up. (c) Of the very large percentage of children who leave school at from fourteen to sixteen years of age a large part require, during their last two years in school, a very different educational program from anything now offered them in the traditional courses. (d) During the period between twelve and sixteen it is possible to give a very considerable fitness for vocational pursuits, even tho such preparation cannot be specialized so as to in any marked degree dispense with the usual apprentice-

[1]Paper presented at the National Education Association, Cleveland, Ohio, June 30, 1908.

ship period, but that it can aid in the selection of a calling, and the right industrial or other vocational training will give a body of useful experience and habits.

It is the purpose of this paper to discuss the questions: (a) What are the group differences that should be recognized as a basis for differentiation, and therefore, for secondary education; (b) Where should differentiation begin; (c) What should be its character; and (d) What are the conditions of its administration.

GROUP DIFFERENCES AS A BASIS OF DIFFERENTIATION.

Three kinds of differences are recognizable among children with reference to the extent and kind of education which, in the secondary stage, they should receive. These are based on (a) native capacity, including strong interests and tastes; (b) economic conditions of the family and its capacity to support the child during the period of its higher education; and (c) probable educational destination.

a. Our measures of native capacity are yet crude and uncertain. Yet practically we keep large numbers of children back in grades because of inferior ability to do the work required, or for lack of interest in it. In the early years of the high school we practically exclude large numbers because of lack of capacity. Parents are constantly removing large numbers of children from school because they are convinced that such children can no longer derive profit from further study. It is now suspected that in the case of many children apparent inability may not be so much native as due to bad pedagogical methods; or that it may in many cases attach to certain school subjects and not to others, particularly where, as in the case of foreign languages, no social premium seems to be put on their study. Again, it is not improbable that apparent native ability may be connected in some way with pubescence, so that the seemingly dull child may gain in ability after the change in life, or vice versa, the precocious one lose. But, even under present conditions of uncertainty, it is possible to recognize various groups of capacity, and it would be possible to measurably predict the future educational career of a large majority of children after they have reached the age of twelve. There will be those who probably cannot finish the elementary course, those who will have no sufficient capacity to enter or stay in high school, those who have not the qualities for business, those who have no interest in manual arts, etc.

b. Sufficient attention has not yet been given to the conditions under which the economic status of the family affect the educational careers of children after the age of fourteen. The majority of the populations of the cities are wage earners, the family income is not large; to keep a child in the high school costs the family from $200 a year up; and if there are several children, the pressure to have the older ones relieve the burden is very great. It is well known that among manufacuturing peoples a very large proportion of the children enter employment early. This does not preclude the fact that often a boy or girl of exceptional capacity for school work will be kept at school at considerable sacrifice by the parents if it clearly appears that such sacrifice means ultimately the marked success of the child; but these cases are not numerous. It is not in evidence that the school authorities have studied, in connection with the large withdrawal from school at the age of fourteen and during the early years of the high school period, the economic condition of those who thus withdraw. Undoubtedly large classes could be found in which such withdrawal is a necessity, quite apart from the question of the ability of the pupil. It is highly probable that at the age of twelve or fourteen it will be found that a sufficient number of chidren are obliged to prepare for early entrance into industry to justify consideration of their special educational needs. At any rate this should be regarded as a basis for group differentiation of opportunities.

c. Present educational practice differentiates between boys and girls in the provision of manual and domestic work, in view of their different educational destinations; in a few cities special high school preparatory classes exist for children who, at the age of twelve, obviously are qualified and intended for high school work. In reform schools and various other types of special schools, children at the age of twelve or later receive a kind of education suited to their probable future needs. In the American secondary schools as now organized some opportunities for specialization are offered to those who wish to take up commercial work, to prepare for college, etc. But in the main, American education, unlike that of Europe, refuses largely to take account of the probable educational destination of its pupils, especially those under sixteen years of age; the reason for this exists in the general tradition of the democratic character of American education, but it actually operates, as we believe, to render such education undemocratic. At first it would appear that differentiation of education ac-

cording to educational destination could only affect vocational training, but a study of the conditions of life will show that the cultural and social needs of the varying groups must make different demands upon the kind of culture and social training given. The cultural and social training of children who must enter into industry at fifteen should for the years from twelve to fourteen be in many respects different from that of those who are probably to have a high school and college education. Futhermore, there are excellent reasons for believing that cultural and social training should be in some degree correlated with vocational training, to the end that each may be most effective. But this is impractical unless the educational system provides for several possible goals in organizing education for youths from twelve to sixteen.

THE BEGINNINGS OF DIFFERENTIATION.

With few exceptions, American elementary education assumes uniformity of course for all children thru the eighth grade or approximately thru the fourteenth year. Nowhere else in the world do we find similar practice. But it is well known that much more than a majority of the children in the public schools either do not complete the eighth grades or do not go beyond them; and all of these may be assumed to quit school as soon as the law allows. Because during the last two grades no specialization has been permitted it has proven difficult to make anything of the vocational subjects like commercial arithmetic, accounts, manual training, and domestic arts that have been introduced; nor, on the other hand, has it been practicable to make the beginnings of algebra, geometry and foreign languages for those children obviously destined for a secondary education. The widespread demand for a six years high school course indicates a call for earlier differentiation than is now possible. European practice in all countries makes provision for extensive differentiation at twelve or earlier. There can be hardly any question but that, by means of special courses, large numbers of those who cannot complete the grade work in our city schools could be better accommodated, than at present. Furthermore, if in deference to well-defined demands the attempt is made to introduce some vocational preparation for children who leave school at fourteen it can only be done by offering several courses, any one of which may be begun at the completion of the sixth grade, or so much of the elementary course as may constitute suitable preparation. In other words the time is ripe to recognize the following facts: (a) Secondary education should involve differ-

entiation according to educational need, and this begins to manifest itself earlier than the traditions of American education have established; in fact, after the sixth grade, there should be allowed some opportunity for differentiation; (b) Whether or no we choose to call all of the courses thenceforward followed secondary or not, they should all be regarded as equal in the sense that each, for the class of children adapted to it, offers a first-class education, even tho some of these courses must terminate at the time when the pupils average fourteen.

THE CHARACTER OF DIFFERENTIATED COURSES.

Obviously there must be strict limits to differentiation of courses in the upper grades of the elementary school and the earlier years of the high school, owing to administrative necessities; but it is clear that some account must henceforth be taken of vocational work as a factor in some of these courses. Opportunities for vocational training are becoming increasingly difficult in other channels of life than the schools; these must realize their added responsibilities. We may not here enter into discussion of the kind or degree of vocational training possible for children from twelve to sixteen. We may even assume for the present that specialized trades training, or any other kind designed to produce a considerable degree of immediate fitness for any given vocation is impracticable; but on the other hand, we have abundant experience to prove that a somewhat general form of vocational training along several different lines is an entirely feasible thing. It is possible to begin at the seventh grade and give, along with an ordinary program of studies, considerable training in commercial subjects; or in the use of tools, as found in the industrial arts; or agricultural arts; or yet again, in the household arts for girls. Such training may be made very concrete, may utilize actual vocational practices and economies, and it should give a large amount of habituation, intelligence, and ideals which, when specialized training comes later, will give a satisfactory background for the latter. At present in our commercial arithmetic, domestic arts, and industrial arts we make but the merest beginnings in this direction; and our work is often discredited in advance by wrong pedagogic theories, and the fragmentary time and energy which we devote to this work. How futile must our education be if we cannot in a manufacturing city, for example, take the thousands of boys who shortly after fourteen will enter on some form of apprenticeship, and give them some of the general contact with tools and materials which under-

lie their future vocation, and if we cannot in that connection develop a basal experience to that end, and that without taking more than a portion of the time from the more academic studies!

But again it must not be assumed that such vocational courses should be the only ones found in the program; we are assuming that they are offered simply for those who most incline towards them or have most need of them. In the elementary school, and the high school as well should be found courses ministering exclusively to cultural ends. No more fundamental mistake has been made in the elementary school than in prescribing manual training for all children alike, once it has been introduced, and before its educational value had been fully ascertained. Vastly better would it have been to have established good courses in manual training, even to be taken four or six hours a week, for those who especially cared for that work. It would then have had some vital educational and vocational significance.

CONDITIONS OF ADMINISTRATION.

Under ideal conditions the execution of the above program would require the general recognition of a six years high school and the abandonment of the last two grades of the present elementary course. Pupils completing the sixth grade, or otherwise qualified, would find open to them several courses so arranged that it would be possible for those probably quitting school at fourteen to receive in their remaining two years a maximum of preparation, but also permitting those who could look forward to a considerable secondary school and college career to make suitable beginnings for that. To a considerable extent all these courses would involve identical work in certain subjects, as English, history and geography, the differentiation taking the form of alternative groups of remaining subjects, as (a) foreign languages and mathematics of secondary school type; (b) natural science, music, art appreciation, etc.; (c) commercial subjects; (d) agricultural subjects (in the right environment to give these a true vocational significance); (d) industrial arts, perhaps differentiated according to locality and dominant types of adjacent industry; and (e) household arts. It should not prove a difficult matter to adjust these courses so that pupils leaving at fourteen would have received considerable profit, while for those who stay until sixteen a considerably more extensive development would be possible.

But, in case the six years high school course appears too radical,

it should be evident that by a slight differentiation of courses in the last two grades of the elementary school, that remaining just as it is, and the departmentalizing of some of the work, almost the same results could be acomplished. In some large cities these grades now assemble in separate buildings, the schools being called intermediate; and American education is not at all unfamiliar with departmental work and specialized teachers in the upper grades. If we increase and enrich the manual training offered, relating it closely to familiar types of production, and making it possible for certain classes of pupils to substitute something else for it, as foreign languages in the one case, or commercial subjects in the other, we shall have the proposed program in its essence. Already the beginnings of this are found in cities like Baltimore, that maintain special high school preparatory classes, and in those special classes for defectives and delinquents found in some cities where special programs of study are prepared to serve particular ends in the training of children that do not fit the ordinary program.

Similarly, it would not be at all impracticable nor administratively difficult to provide in our large city high schools, in addition to the college preparatory courses now maintained, at least one general culture course especially designed for children who will leave at sixteen; and other courses of a more vocational character also of two years in length, embracing the lines mentioned above.

Of course there are several time-worn objections that must be faced. It will be said that it is not democratic to thus force children early to choose special lines, as is done in Europe, where social standing practically determines the educational destinations of children, but nothing has been said here about forcing children into any of the above courses except in so far as they have apparent ability for one, and tested inability for another. There is contemplated only the very democratic thing of providing a variety of opportunities, and then endeavoring by study of children, counseling with parents, and taking account of the probable future of the child, to secure to each course those who shall profit most from it. Equal opportunities, but these varied according to ability—that is all.

Again, it will be objected that at twelve, fourteen, or any other age children are too young to choose. It is hard indeed to say when young people are old enough to choose, but it should be remembered of the class here under discussion that choices are always being made whether we will it, or acknowledge it, or no. More than eighty per cent of the

children in the schools, forced to take what is given them, elect to leave school between fourteen and sixteen; could the schools provide some channels of educational activity which would not be as unfortunate as this election? But it is not contemplated that children shall elect; it is assumed that the schools would provide the means whereby parents could be informed as accurately as possible of the significance of each course, that the abilities of children would be taken into account as well as their dominant tastes and interests; and on the basis of the parents' wish and the judgment of teachers this or that course should be recommended. Can the provision of equal opportunities for all according to need and ability go farther? It may with assurance be said that no such intelligent attempt as that described above to adapt children to the form of education most suited to them has yet been made.

Finally, there will be raised the question of expense. The writer believes it can be shown that in city schools the earlier differentiation of work will not involve more classes than at present, tho of course the addition of vocational work will require more teachers and equipment. But the assumption thruout the paper has been that public demand will soon force the schools to hold open to all classes, rather than as now to a chosen few, opportunities for vocational education of some sort. The assumption has been that we have agreed that the new form of education, expensive tho it be, will prove a profitable social investment.

Finally, let it not be said that any such program as that contemplated above requires any sacrifice of the education which makes for culture or for effective citizenship. Rather I believe it will promote it. We too often forget the very meager degree of cultural education now realized for the majority of our pupils; we forget that one or two hours a day of the right kind of study by pupils interested in their education because it is vital to their needs, may give much more of culture and civic training than we accomplish at present. We sometimes forget that with certain types of pupils and under certain social conditions the more effort we expend, the less we get in the way of educational result. We have not yet learned all the lessons of casting the bread of our educational efforts on the current of contemporary life, with its possibilities of larger returns.

THE INTERNATIONAL ART CONGRESS.

H. WILLIAMS SMITH.[1]

WHEN a man, accustomed to look upon all education as his province, is asked to regard education in art only, and further to deal more particularly with manual training as correlated to art education, he should be an adept in the work of elimination —always a more difficult task that the work of amplification. This is my case at present, and in this article, in which an attempt will be made to give a just but brief impression of the third International Art Congress, which has just concluded its sittings at London, and of the exhibitions which accompanied it, although I shall endeavor to give manual training the most prominent place, I shall rely greatly on the reader's exercise of his undoubted right to "skip" whatever he may consider to be irrelevant matter.

Let me say at once that if I am to deal with manual training more than with education in art, I must do what justice I can to the tail of the dog, and try to neglect as far as I am able the dog itself; for—to speak plainly if the above metaphor be not sufficient to make it clear— manual training, as a component part of this Congress, loomed no larger than the abbreviated tails of certain terriers as compared with the rest of their corporeal substance. This last sentence admits of two qualifications. In the papers read before Congress manual training received bare recognition, but in the exhibition it was allowed to display itself on a scale which more befitted its importance as a correlated method of education in art; nay, as even, in and by itself, being capable of serving in no small degree the purposes of art culture. In this way manual training, consistently with its function, asserted itself more emphatically by what it *does,* rather than by what it *says.*

I shall be obliged if somebody will be pleased to tell me where manual training ends and art begins; and where manual training ends and

[1] Several months ago the editor was fortunate in securing the promise of two articles on the London Congress, one from the English standpoint and the other from the American. The present article is by Mr. H. Willliams Smith, joint editor of the *Manual Training Teacher,* who will publish his article simultaneously in England. We are confident American teachers will be much interested in Mr. Smith's report. The second article will be written by Dr. James P. Haney.

science begins; and where manual training ends and the three R's begin. The overlapping, the running side by side, the dovetailing of educational subjects is inevitable, and, as a matter of fact, every paper read and every exhibit shown was as interesting to the manual training master as to the art master. There is no denying that all art is manual training, even if all manual training is not art. So I reckon manual training owns a bigger interest in that dog after all than its much curtailed caudal appendage.

The Congress meetings were held at South Kensington in the great hall of the London University, which august institution now occupies a large part of the Imperial Institute, a building which, architecturally (I speak as a Londoner) is one of the most satisfactory adornments of our great city. The Imperial Institute possesses a fine lofty tower, and you enter under this tower into a dignified interior, and then you proceed along up steps until you emerge into a very undignified interior, an erection composed of common wood, corrugated iron, cheap window glass, and dingy paint, and this, let me inform you, is the "great hall" of the University of London. A temporary building, symbolical of the British attitude in things educational. An atrociously ugly building, symbolical of the British attitude in things artistical. But I had better not start writing about my beloved country's shortcomings in these respects, or manual training will be a very bad second, and art nowhere.

The great hall (by courtesy) was nearly filled on the opening day by delegates to and members of Congress, from all the peoples who believe more or less in education; and a musical babel of voices rose in chorus as I walked in—not due to my appearance, of course. The conglomeration of voices struck the ear with a different effect from a similar number of voices all speaking, say, the English tongue; and thereby came a cheerful thought as I listened. The old Bible story relates that, ages ago, many men met together for a common purpose, a work of art in fact, but that their megalomaniacal, if not impious, purpose was frustrated by a confusion of tongues ensuing amongst them. Disheartened by their fruitless efforts to understand one another, they dispersed, and, we may presume, after getting by some means roughly sorted out, proceeded to occupy Pekin and Philadelphia, New Zealand and Nova Zembla, and all the uttermost parts of the earth. Now in the present year all we descendants of those rash tower builders, still retaining our confusion of tongues, and patriotically proud of them into the bargain (more especially the Welsh), meet again with a common purpose which will not be

frustrated—namely, to put another story on the beautiful palace of art, and, with no need of interpreters, to hear what each is writing and saying for the good of all in the glorious language of line and mass, of form and color.

Can we prize art and music too much, seeing they are universal languages?

Is not the International Art Congress also an International Peace Congress?

Do you think I needed to know all the languages (at least half a dozen) in which the lectures were delivered, or to understand all the animated remarks provoked by the exhibits, to enter into the spirit of that Congress? No! The tide of comradeship, of mutual aims, of hopes shared, of work accomplished, of greater things yet to be done, overflowed all the barriers of race, creed and language, and floated us all under the same proud colors.

The Earl of Carlisle, in his presidential address, said that, "The originators of the International Federation of Drawing Teachers, which held these congresses, were a handful of French teachers, who were present at that meeting." Justly proud might that handful be, and proud and thankful may the whole world be, for what La Belle France has done, and is doing, for the betterment of the human race, not in art alone, but in all departments of civilization.

There was no Government reception of the delegates. Our Government, like all other governments, is not averse to fighting the foreigner on small provocation, but is not willing to shake hands with him unless tremendous pressure is brought to bear upon it. Liberal or Conservative, it matters not, all governments are equally bad in all countries, if not always in this, in many other similar important respects. We did very well without the Government. We generally do. Educationists are sufficiently educated not to feel touchy on such matters, but that does not excuse the Government. Lord Carlisle said he "hoped the members would attribute this marked neglect rather to extreme stupidity than to any intentional rudeness."

I must here ask my readers to accept a few notes taken on the spot of some things which drew my special attention during the Congress sittings. If I attempted to put these notes into a better literary form I think they would lose in force what they would gain in grace. A few excerpts from the papers read which seemed especially applicable to manual training appear in another place.

The sessions of Congress were presided over by Sir John Gorst, and nothing could be more agreeable and inspiring than to see this great veteran educationist filling such a post of drudgery with the utmost punctuality and attention to his duties, at an age which most teachers hardly expect to reach. Very gratifying also was the regular attendance of Sir W. B. Richmond, who, whether officially or unofficially I know not, identified that distinguished society, the Royal Academy, with the efforts of this Art Congress.

Rather more than half way down that corrugated iron hall I had much difficulty in hearing most of the speakers. Members were supplied with galley proof sheets of all lectures, but reading these and hearing a murmur of sound from the platform did not constitute an ideal in oratory. The attendance was good on the first day, gradually diminishing to the middle of the week, and then revived toward the end. The women were better stayers than the men.

The status of drawing teachers, from the remarks of certain speakers, appeared to be almost as unsatisfactory as that of manual training teachers.

Travail Manuel had a strong-voiced and pretty dogmatic advocate in M. Montfort, Inspector of Manual Training for Belgium.

Mr. E. Cooke, who is almost a landmark in London education, was at his best in a paper on "Experiment."

Mr. Viktor Tardos, of Buda-Pest, read two papers in English with an excellence of manner that some whose native tongue is English might envy.

Miss Phillips, of London, whose great maternal heart sheds its benign influence over such a multitude of little ones, touched her audience by her enthusiasm and feeling perhaps more than any other speaker.

The practical note was sounded strongly by Mr. Sykes, of Bradford, ex-President N. U. T., and his peroration, to my mind, was the most effective of any.

The paper by Mr. Symons, of Aberdeen, was interesting, as showing that, for once, an education department had issued a memorandum worth reading and worth adopting.

The naiveté of many American speakers is sometimes delightful, and sometimes depressing. Professor Wesley Dow's printed paper was excellent, but his spoken resume of it was delivered as if at the head of his college class. Dr. Haney, with a paper of equal excellence, furnished us with a happy resume, which, although somewhat "flowery,"

was intensely earnest and inspiring. I have a family feeling where America is concerned, and like my nearest relatives to make a good impression.

The paper read by Mr. H. T. Bailey, editor of *The School Arts Book,* was one of the standing successes of the Congress. He was one of the few who *did.* He dabbed lightning sketches on the blackboard in such a manner as was calculated to strike envy into the soul of the finest ethicist who observed him. I am so accustomed to expect supreme ability in many fields of human endeavor from New England that I was not, perhaps, so much impressed as many present manifestly were.

I proceeded subsequently to interview Mr. Bailey with the design of having a long friendly chat with him over his school work and mine, and his editorship and mine. That interview got packed pretty close. It began, *consisted of,* and concluded with one handshake. There is no doubt that in a nation of busy men Mr. Bailey must be one of the busiest.

A manufacturers' and publishers' exhibition was held contiguous to the Congress hall, in which that veteran educationist, Mr. W. Harbutt, personally attended at one of the most conspicuous exhibits. The exhibition was of much interest, but not nearly so diversified and extensive as it ought to have been.

Of the great exhibition of art work held in connection with the Congress, I have presented elsewhere some random notes, which bear more particularly upon manual training. It was one of those exhibitions which make you wish you were going to beat the record of Methuselah. I pity the poor delegate who tried to do that exhibition thoroughly, and also to inspect the vast accumulation of exhibits in the South Kensington Museums, together with the educational exhibits in the Hungarian and Franco-British Exhibitions.

I have devoted a whole week of my summer vacation to visiting this Congress and writing about it, and I am not sure whether such conduct deserves praise or blame. I leave it to my readers to decide. I am very, very glad I went to the Congress, and just a wee bit glad it is all over.

Altogether, with a certain amount of exaggeration, a liberal tincture of pedantry, a lot of misplaced emphasis, and a good deal of trite utterance, which were cheerfully endured, and freely forgiven, the sittings of the Congress composed an intellctual enjoyment, and constituted an educational asset for every person who attended them; and, without the slightest doubt, this Congress, with its attendant exhibition, will go far

to spread the growth of art and manual training on a sound basis for truly educational ends.

RANDOM NOTES ON THE EXHIBITION.

Leicester made a good show. Woodwork course simple and well graded, but very formal.

Some clean cut wood-carving from Settle, Yorks, in which a panel left from the tool compared favorably with panels finished with a dull polish.

Bradford, Yorks, exhibited three representative panels for first, second and third year wood-carving course, but the leap from second to third year seemed too great. Bradford also displayed some excellent specimens of woods trying to make out that they were much more costly woods, and, worse still, woods trying to make out they were costly marbles. I object to art education recognizing such fraudulent monstrosities.

An admirably carved study of a cock was shown by the Birmingham School of Art.

Glamorgan County Council had a large show of woodwork from Penarth and Barry. It was of a stereotyped character, however, and of that kind where one or two pet ideas in design trail over the whole course. Glamorgan also displayed a nice lot of carvings, left from the tool. The Christian Brothers' Industrial School, Belfast, with the exception of one German exhibit, referred to later, reached the lowest ebb in unattractive schemes. They showed a scheme of joints and exercises which, in an industrial school, is perhaps a form of punishment, and as such will not fail to be efficacious. The same teaching brotherhood made a better show of metal work from their trade preparatory school, Belfast.

A well-thought-out scheme of woodcarving and metal work, combined in some cases, came from Limerick Technical School.

Perth Academy, Scotland, had a neat display of repousse and woodwork combined, and also a selection of metal work.

Wolverhampton sent a fine range in caskets. Caskets in metal, in wood and metal, and caskets covered with tooled leather, applique, or decorated with enamel. Geneva made a beautiful show in woodcarving and art metal work, the repoussé especially being of unusual excellence, and worthy, in fact, of good pupils of Benvenuto Cellini.

The Apprentice School of Zurich made a very large, very thorough, very capable, and very wearisome display of mechanical drawings.

From Punjaub, India, some well-graded, clean-wrought examples of woodcarving and repousse were shown by the Mayo School of Art. It did not appear from this exhibit that the director of this school favors the marvelous, minute, eye-and-soul destroying craftsmanship of which so many wonderful but distressing specimens are to be seen in the Indian Museum at South Kensington.

The Bishop Field College of St. John's, Newfoundland, showed a large exhibit of cardboard work, and of woodwork betraying the influence of London, but not the influence of the cod-fishery. There was nothing in this scheme to denote whether it hailed from Newfoundland or Timbuctoo. Of course, Newfoundland is not the only, nor perhaps the worst, sinner in this respect. Every place is alike the world over as far as manual training is concerned, and in this exhibition little was shown by any country but arbitrary schemes reflecting nothing of child life, and indicating no sympathy with child nature.

Austro-Hungary excelled, perhaps, all other countries in wide range and thorough display.

The nude studies from the Art Museum, Boston, U. S. A., seen *en masse* had a rather distresssing appearance, in fact the oil studies of the nude throughout the exhibition suggested a need for wearing apparel which no masterly study of the nude ever *does* suggest. The charcoal studies were far more pleasing than the oils.

The American exhibit was "prodeegious" and occupied more space than any other. What makes all the New York City display look so smoke-dried? Beyond a little leather work no manual training was illustrated. A collection of drawings for all grades, selected from sixty representative towns and cities, was the most comprehensive and largest of all the exhibits in the entire show, as befits the land of big things.

London showed no manual training work pure and simple, although the Craft School had a very strong exhibit of glass, metal and inlay work and woodcarving. Shoreditch Technical Institute also exhibited some beautiful inlaid furniture, among which a jewel cabinet, inlaid with mother-of-pearl, deserves special mention.

Holland showed some very pleasant simple woodcarving, very delicately cut, in low relief like their own remarkable country. Good inlay, metalwork and needlework also went to the making of one of the most complete displays in the exhibition.

In search of the grotesque we try Germany first, and usually need to stray no further. There was much of the grotesque in Germany's

contribution, but much that was of great value also. I must confess, however, that I was disappointed that the country of education, *par excellence*, had not a display proportionate to its mighty capabilities.. Incised woodwork picked out in various colors was an attractive feature, and cardboard work in colored and patterned papers another. The woodwork shown was of a suitable simplicity, but the dreadful formal course shown by Munich was superior in its repulsiveness to that of the Christian Brothers previously mentioned.

Every art and manual training master should procure a copy of the illustrated handbook of the exhibition. It constitutes a most delightful souvenir of one of the most important educational exhibitions of recent times, measures 11 in. by 9 in., 76 out of its 108 pages are devoted to illustrations, and it may be obtained from the offices of the Congress, 151, Cannon Street, E. C.

EXCERPTS FROM SOME OF THE PAPERS READ.

Space will allow me only to notice in the various papers such references as may appear pertinent to a consideration of the interests of manual training.

If the community would improve the dwellings and the environment of the dwellings of the people, would give good physical and manual training to all children and would place within easy reach of every family a playground, a planted open space and an art museum, . . . I am convinced that it would raise the level of life in towns to a height which hardly anyone at present believes to be attainable.—*Mr. T. C. Horsfall, Manchester University Settlement.*

All advanced drawing should be carried on in association with the learning of a craft, be it carpentry or sculpture; nothing else makes it sufficiently real and vital.—*Professor Lethaby, R. C. A., London.*

Craftsmanship improves draughtsmanship. . . . Craftsmanship and practical teaching have come to stay.—*Mr. W. H. Berry.*

Education (half a century ago) was given a wrong trend. . . . degrading the craftsman, who could only better himself by rising out of his craft instead of in it. . . . It is a demand for captains of a demoralized industry which asks first, not "What can we make of this?" but "What can we make *out* of this?" . . . Our teaching is delightful but not easy. It is of that type which, after long conflict, is now most valued; doing which begets thinking and leads to learning.—*Mr. E. R. Taylor, Birmingham.*

School teaching, which supplements factory or workshop training, promises, in some ways, better results than training in a technical or craft school. It occupies, for one thing, a larger field, and does not exclude the amateur, who, after all, is not a negligible quantity. It is of no use training workers to do good work if we do not train purchasers to appreciate it when it is done. . . . For

my part, I am against the undue exaltation of the artistic ideal in schools. It ought always to be there at the back of all the teaching, but it should not be talked about too much. Good work is ambition enough for the ordinary student. The extraordinary one will go beyond that to the full extent of his genius.—*Mr. Lewis Day, London.*

It is absolutely impossible to make handwork "a living, throbbing element" in the life of our schools under any system or method of training which does not include as an integral part of the scheme definite class instruction in the science and art of teaching, free and mechanical expression with brush and pencil, and handwork subjects such as will effectively link up the lower and higher form work with the ordinary routine work of each class.—*Mr. J. H. Judd, Manchester.*

If efficient teachers of drawing are to be secured, one of the necessary conditions is that examinations should cover professional fitness. The tests, so far applied, deal only with technical ability, and certificates may be held without assurance of ability to teach.—*Report of Training Sub-Committee.*

From the Parthenon down to the pottery tea bowl of Japan the ability to choose well is the secret of successful art work. Education has been defined as that which enables one to make better choices.—*Professor Wesley Dow, New York.*

It is just where language fails that drawing is most effective in giving it a clear interpretation of ideas.—*Professor Nadler, Buda-Pest.*

The ideal plan would be to make it compulsory for school boards to have a special art master, guiding the teaching throughout a number of schools, unifying the work, and fixing some definite aim.—*Messrs. Hannah and Moffatt, Scotland.*

Construction has a peculiar fascination for most children. Its crudest matters of fact appeal directly to their imagination.—*Miss Rosa Waugh.*

Drawing not only stimulates observation, deepens impressions, and helps thought to form clear ideas, but it is also a means of expression and verification; speech helps the process of thought, but drawing helps to form ideas themselves. —*Mr. E. Cooke, London.*

Wherever and whenever man has existed there we find traces of his work, of his creative and productive spirit. This instinct to use the hand to make marks, to use any plastic material to express some idea or to produce objects for use or ornament, is one of those we select for survival. . . . Realising that the infant's drawing is a part of the little child's whole daily activity, whereby it develops its mind and body through contact with the exterior world, teachers now use it, not as a detached "subject" to be taught, but as a means of education, a method. . . . To be men with brains to think, and energy to work, the little creatures *must be children* and *live fully* through the play stage, the practising and experimental stage of the marvelous organism.—*Miss K. Phillips, London.*

Great skill in graphic representation is always accompanied by considerable intellectual attainments. The converse, however, does not hold good.—*Dr. Kerschensteiner, Munich.*

After all, where children are concerned, it is the men and women teaching

them who count, not mere cut-and-dried schemes, however clever they may be. . . . The true teacher is also an artist, and his picture is a whole-souled, healthy boy or girl. . . . No inspector can come into a school and from his superior knowledge assess the value of the work done in set terms. The quality of the work done will vary according to the conditions under which it is done, the character of the child and the personality of the teacher. By the time the inspector had in any way mastered these three factors he would, if he were a sensible man, have probably decided that there was a much more profitable line of action which he might take than that of mere critic and fault finder. . . . I plead for freedom for the primary school teacher, freedom to experiment, because educational science is still in its experimental stages; freedom even to make mistakes, freedom to use a big waste paper basket, which no prying eyes shall ever see, nor assessing hands shall ever turn over; and the more freedom the State gives to the teacher, the more value will the teacher yield in return to the State.—*Mr. T. P. Sykes, Bradford* (*ex-President N. U. T.*)

The modern striving after false decorative effect and the modern display of so-called personality, often leads to such a violation of style that we are given to express our aversion by asking, "Who may be guilty of that?"—*Rektor Hana, Amsterdam.*

Study of the curriculum has shown that no subject can be successfully taught apart from other subjects. . . . The secret of success in drawing, as in all manual work, lies in having the process thoroughly understood, and the manipulation—that is, the muscular movements—familiar. . . . Children's work should be childish, it should acknowledge the youthful hands that made it.—*Dr. J. P. Haney, New York.*

It is the intelligent minority which is the backbone of a nation. . . . It is machinery that has killed this habit of choosing the best; it has produced a poverty and monotony of design; it has produced goods which have no lasting endurance; it has well-nigh killed handwork and introduced a new type of slavery into modern times. . . . There is no good teaching excepting that which is founded on a scientific basis. To cultivate only enthusiasm is likely to lead to nothing.—*Sir W. B. Richmond, R. A.*

With these utterances of a great artist, who is the son of a great artist, and who was named after a great artist, William Blake, these excerpts may fitly be broken off. It has been my aim to bring together a collection of sayings which shall give the reader a fair idea of the great mass of papers to which I have listened and all of which I have read through at the end of each day. As I said at the beginning, I have, however, although somewhat against my inclination, had to confine myself to the manual training point of view.

I trust I have, notwithstanding my limitations, provoked in the reader a desire to obtain the full report of all the proceedings, which will be issued in the near future, and to which I hope to refer when it appears.

HOW THE SCHOOLS MAY HELP THE FORESTRY MOVEMENT.[1]

T. B. Kidner.

THE part played by the manual training schools of New Brunswick in the important matter of forestry is not, perhaps, a very large one, but in view of the great importance now attaching to the question of the conservation and development of the forest wealth of this continent, a brief account of what the schools are doing may be of interest for two reasons. The first is that, in line with the endeavors now being made to arouse and educate the people generally to a realization of the importance of the matter, it seems advisable to awaken an interest in the children. Secondly, in the manual training schools we are dealing with the pupils at a very plastic time, when lasting impressions will be made upon them and we must remember that they will have to deal with this question of forestry when it becomes a much more acute one a few years hence.

We have some twenty manual training schools in the Province of New Brunswick. They are not, I may say, manual training schools of the type now so familiar in the United States—the manual training high schools of the cities. We have not yet any manual training high schools. We have, however, departments of manual training in connection with the common schools and they are attended chiefly by the boys of grades six, seven and eight, the highest grades in the common schools; that is to say, by boys from eleven or twelve to fourteen or fifteen years of age—a most important age from an educational standpoint. In some few instances the high school pupils attend the manual training schools, but the high school manual training is merely incidental and we have no recognized manual training in our high school course at present.

The boys from these upper grades I have mentioned, spend half a day each week in the manual training room and there they make articles out of wood from working drawings previously prepared by the boys themselves; not with a view of making them tradesmen, not from any vocational aim which we may have in other schools of somewhat similar type, but merely from an educational standpoint, a standpoint recognized by educationists and men of affairs alike to-day. That is to

[1]Transcript of an address to the Provincial Forestry Convention.

say, that an education which consists entirely of the study of books does not fit one for the work of this world and the demands that will be made upon the men and women of the future. Therefore we carry on this work, not with any idea of preparing the children for particular trades, but to develop them in the broadest way and to give them an all-round training so as to reach that side of their nature not reached by books.

Side by side with this instruction in drawing and tool work there is given at every session a brief lesson dealing with the properties of the materials they are using. The lesson takes the form of what educationists known as an object lesson, that is to say, a lesson illustrated with specimens and by experiments. As many as possible of these are given in the course, which is carried on for about three years.

I prefer the term which we give in our training course to our object lessons, viz., "General Intelligence Talks," for their aim is to arouse the intelligent interest of the children in the materials they are using and to enable them to understand the principles involved in construction. To this end we have arranged a series of lessons, a brief schedule of which I shall present to you in a moment and these are carried out, as I have said, at every session of practical work. The boys spend one-half day per week in this practical work, during which they are excused from the ordinary studies. They make their working drawings and then construct some article of wood and are given this object lesson, this scientific demonstration of the properties and the characteristics of the materials they are using, side by side with the benchwork. The schedule of lessons is as follows, but I am leaving out of this the lessons dealing with materials other than wood—the metals and the glue and the other materials that are dealt with necessarily in the shop work.

SCHEDULE OF LESSONS ON THE TREE, ETC.

The Timber Tree—

1. How it grows.
2. The three broad divisions, bark, sapwood and heartwood.
3. The annual rings; their divisions and their formation.
4. The pith rays and their uses:
    (a) In the growing tree.
    (b) In the wood (quarter figure, etc.)
5. The leaves and their functions.
6. The effect of trees on climate and on the health of a community.

7. Fibers and cells (microscope.)
8. Felling.
   (a) Good and bad methods.
   (b) Time of felling (proper season and age of tree.)
9. Conversion (methods.)
10. Seasoning. The necessity for it and the several methods adopted.
11. Warping and shrinking.
12. Quarter cutting.
13. The faults and defects of lumber. Sapwood, large or dead knots, shakes, worm holes, rot, etc.
14. The classification of woods:
    (a) By the trees (broad-leaved and needle-leaved.)
    (By the nature of the wood.)
15. Our chief native woods.
16. Our wasted woods.
17. The properties, characteristics and therefore the uses to which the various woods are put. "Uses follow properties." Various properties, such as stiffness, toughness, pliability, hardness, durability, beauty of grain, evenness of texture, etc., etc.
18. The strength of wood (by experiments and in the design of joints in construction.)
19. The preservation of wood. Paint, oil, varnishes, etc.
20. Field walks: visits to mills, cabinet and furniture factories, timber yards, etc.
21. The collection of specimens of leaves, fruit, wood, etc., of our native and other trees.

The foregoing numbers do not refer to single lessons. Obviously such a lesson as No. 17 would be too much for several lessons, and is, in point of fact, spread over the workshop practice of two or three years.

I said a moment ago that we did not believe in mere talks and therefore, with your permission, I should like to illustrate for a few moments just the sort of lessons we give and the way in which, I venture to submit, we may arouse and do arouse an interest in the minds of the coming generation in this important question of the trees. We commence with a few lessons on the growth of the timber tree and I have here a number of specimens taken from those in daily use at our training courses in the Normal School. On this board (Fig. 1) are shown several sections of timber trees of various types, dealing with

the softest and hardest wood. The specimens on that board (Fig. 2) are intended to show that the timber tree grows outwardly by adding a layer of wood each year in temperate climates. That leads us to the

FIGURE 1.

rings and the study of the way in which the rings of growth are formed and their effect on the grain of woods. With a cheap microscope very much interesting work can be done just in the study of the growth or formation of the annual ring. We go on then to the study of the pith,

or medullary rays, taking, perhaps, a piece of oak or maple, or some other wood which has the medullary rays well defined, dealing with the effect of the rays in the growing tree and also their effect upon the wood,

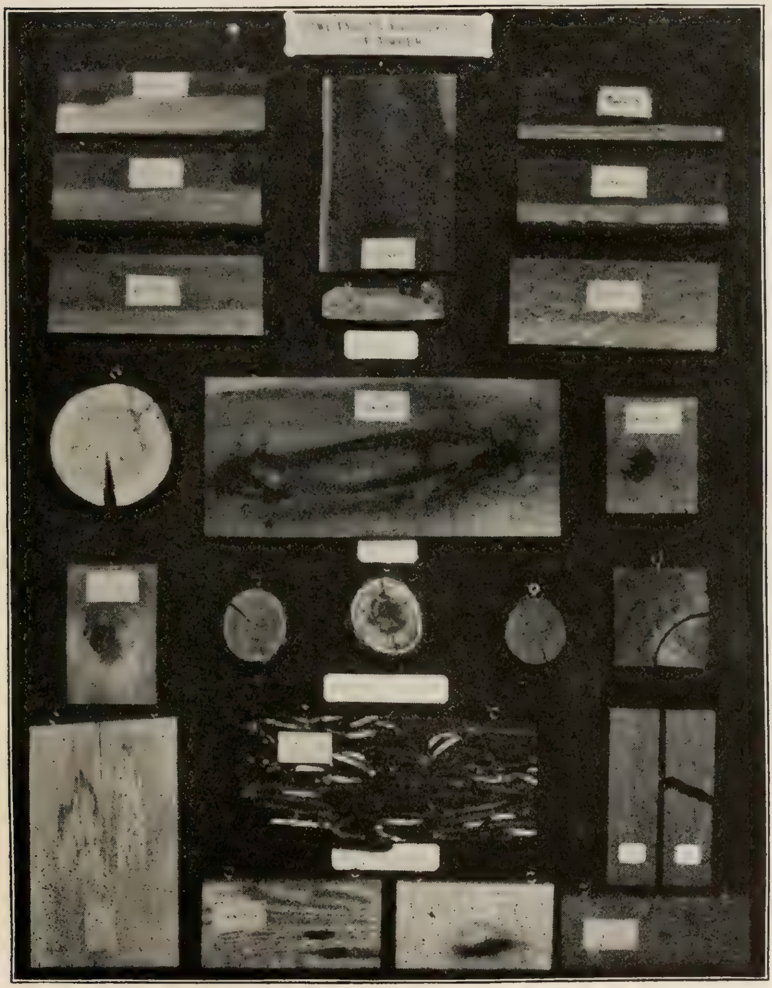


FIGURE 2.

chiefly from the point of view of the beautifying of the wood when it is quarter cut and exhibits the rays in their full beauty. Later on we have to consider the effect of the medullary rays upon the shrink-

ing of the wood, and that is very important, as they have a great effect in the changes of form occurring during seasoning.

Then we take up the leaves and their functions, about which I need

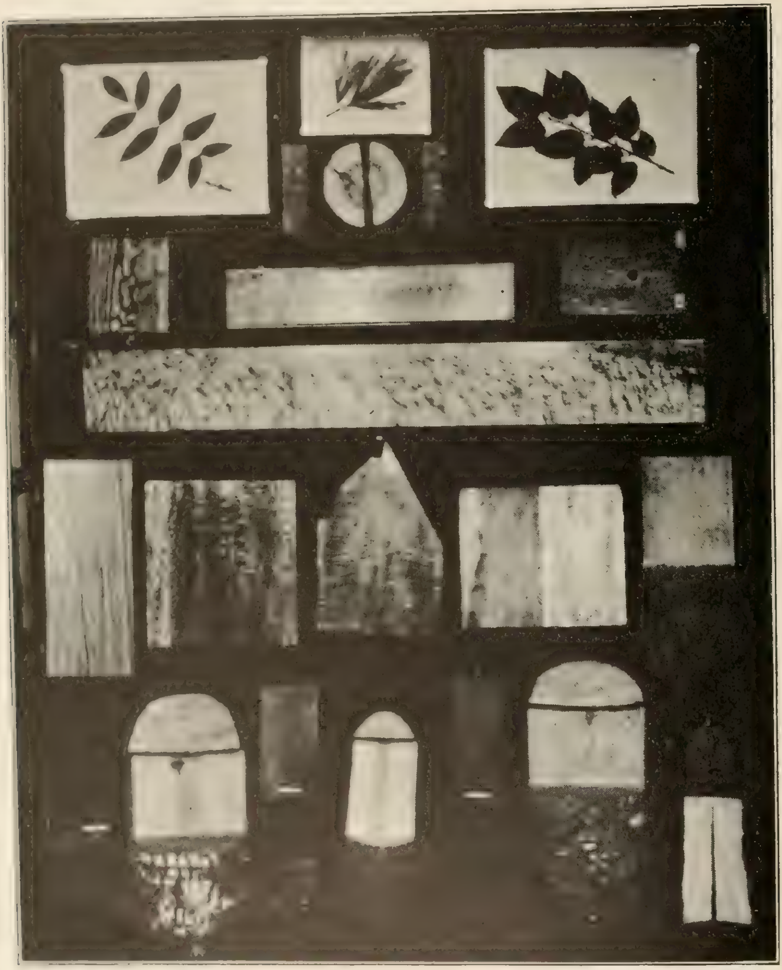


FIGURE 3.

not say much, but of course the effect of trees on the health of a community are taken up in lessons on the functions of the leaves. We deal, of course, chiefly with that beautiful function of the leaves to take in certain things from the atmosphere and give out pure air in their place.

Then we go on to the consideration of the fibers and cells that make up the wood, and that gives us an opportunity for microscopic work, and very many beautiful sections can be made and are made by the boys for use under the microscope in studying this important part of the subject.

Then we get very many interesting lessons on the felling of trees, and in those lessons we are assisted very materially by the excellent publications of our own forestry department and the forestry department at Washington, all of which are placed at our disposal by getting on their mailing lists.

We next take up seasoning; not only the method of seasoning, but the reasons why lumber should be seasoned. That is, of course, full of interest and practical importance. We deal next with warping and shrinking, and we get some very interesting lessons by obtaining from some of the lumbermen the butts of green logs, putting them in well heated rooms and watching what goes on in the course of a year. The warping and shrinking of a board, and the reasons for quartering valuable logs before they are allowed to dry, can be taught very easily by demonstrations of that sort; not by mere telling, but from actual observation of what goes on under the noses and eyes of the children right in the room.

We then go into the faults and defects of lumber; not from the book point of view, but from the point of view of the wood-pile in the corner of the schoolroom; because the boy makes his working drawing, calculates the amount of lumber that he will have to cut out from which to make his article, and then goes to the rack and selects it himself. Therefore our first lessons are devoted to the commonest defects we find; for instance, the defect of sapwood, which is one of the commonest we meet with in several of the woods. Then there are other defects shewn by the spcimens here, such as rot, sapwood attacked by insects, while the sound heartwood is left; large knots, loose knots, dead knots, the various forms of shakes, worm-holes, etc. Then comes the classification of the trees, first, by the leaves, and second, by the nature of the wood. Most of our boys know the names of the trees and can identify them, although even here in New Brunswick, surrounded as we are by forests, the boys are growing up in many of our towns without any knowledge of that sort of thing and cannot identify our commonest trees. Then the study of our chief native woods gives us an interesting set of lessons, as does also the study of our wasted woods, which I consider very important. Only last week I was speaking to our students of an advertisement which has been running for some time in

an American paper, asking for offers of beech logs. The advertisers cannot get them in their locality, while we are burning many tons every year. Then the properties, characteristics and, therefore, the uses to which the various woods are put, open up a very interesting field. We can take a boy's work bench at school and find that a dozen different kinds of wood have been used in the construction of that bench and the different tools he has upon it. These different kinds of wood are not used hap-hazard, but every object is made of some wood that is suitable for it because of the characteristics it possesses.

Next we deal with the strength of wood; but it will, of course, be obvious that in a ten or twenty minutes' lesson we cannot go very far into that subject. We must leave that to the University and higher institutions dealing with it from an engineering point of view; but we can and do perform some very interesting experiments dealing with the strength of a piece of wood.

The preservation of wood. That we do not go into very deeply, beyond teaching the boys a little varnishing, shellacing and polishing, and a little about painting.

The field walks form a very important part of the work in many of our manual training schools, especially in the consolidated schools, where the field work is followed out in connection with all their studies. I have here some leaves collected by the boys[2] and all these folios I have on the table were sent down by the Woodstock manual training school, which is typical of the rest of our schools. These leaves are collected by the pupils, and that means an interest in the trees and an interest in the walks also. Visits to mills, cabinet factories, glue factories and places of that description are also made and serve to lend additional interest to his side of the work. Where we are fortunately situated near

[2] Mr. Kidner's address was illustrated by numerous interesting specimens from the museum of the manual training department at the Normal School, Fredericton, and other Provincial schools. One case shewed the growth of a timber tree and served to illustrate the early part of the schedule of lessons. Another case included samples of the commoner defects of lumber, others shewed many beautiful specimens of our native woods and of many other woods of commerce. Specimens of the largest pine needles known, (pinus coulteri) from the Himalayas, cones of the Norway spruce, etc., etc., were also exhibited. Mr. Kidner explained that they were useful for comparing with our own pine needles and spruce cones, and said that there was no limit to the interest which could be aroused in this way amongst the pupils. A fine piece of California redwood was shewn mounted on a panel and surrounded by photographs of famous redwood trees, logging operations, etc. A collection of Hough's sections also evoked much interest.

a lumber yard we often get a great deal of help. In some towns the merchants have gone out of their way to assist us; regular classes are arranged for, and the instructor is allowed to take the pupils through the mills and someone is told off to guide them through, and thus a very profitable half-day is spent in that way.

Then the collection of specimens for the schools is another important part of the work. You would be surprised at the number of different woods the boys will collect. I was called on the other day to judge of collections made by the boys, and one boy had over one hundred different varieties of wood in his collection. Of course he was situated near the coast, and he had a whole lot of southern woods in addition to the commoner native woods. As I say, he had over one hundred varieties and as far as possible he had named them and had looked them up in whatever books were accessible to him, and in a general way had acquired a good deal of information by the mere collecting of these specimens.

As I remarked, our chief aim is an educative aim, and these lessons are carried on side by side with the lessons in drawing and bench work, chiefly with the view of making the boy's bench and tool work more intelligible to him. That is their main aim; but in a secondary sense I believe they have a more important bearing upon this very much larger question now before us, and I present, therefore, as our contribution to this large question the little that we are able to do in a secondary way in our public manual training schools towards arousing some interest in this most important, this vital question to us in North America of the conservation and preservation of our forest wealth.

SIMPLIFIED MECHANICAL PERSPECTIVE.[1]—I.

FRANK FORREST FREDERICK.

THE sense of color and the sense of proportion are carefully developed by art teachers, but the perspective sense is largely allowed to take care of itself.

By the perspective sense is meant a perception of the relation existing between straight lines—their apparent convergence, direction, length and position; a realization of what is meant by systems of lines (lines that have the same direction); and the ability to think of systems instead of individual lines.

The lack of the perspective sense, on the part of a draftsman, is as apparent in his work, to one who has it, as the lack of the color sense is apparent to one who sees and appreciates color.

Students are prone, in drawing, to draw a line here and another there—one line of a system, then a line of another system—trusting to their sense of proportion alone to bring the drawing out correct in the end. Asked to draw the interior of a room, or a street scene, the student sees only a maze of lines because his ability to grasp the perspective of the view as a whole (his perspective sense) has not been developed.

A glance at the illustrations in the magazines shows how lacking is the perspective sense even among many of the professional artists whose ability to draw the figure seems almost perfect. We see figures standing upon a floor that is not level, or upon a rug one edge of which only rests upon the floor, or dining from a table upon which a cup could hardly be made to stand. These illustrators, in their school days, probably found the perspective class uninteresting, as do most art students.

Is this the fault of the students, or does the fault lie in the manner in which the subject is presented?

All art schools offer courses in mechanical perspective, and in many schools that make a specialty of educating art teachers the students are required to take the course. When they leave school they either forget all about the theory of perspective, or regard it as too difficult to apply to every day problems, or as taking too much time to be taught to their own pupils, because to them perspective had been a matter of T-square and triangle only—its application to practical problems and freehand

drawing having either never been pointed out, or, if it had, so obscured with rules and methods that the spirit of the thing was entirely missed.

The architect and the designer of interior decoration must be master of perspective: it is a part of their stock in trade. The sculptor, the painter and the illustrator have equal need of this knowledge, and everyone who draws should have worked perspective mechanically long enough to have the perspective sense so developed as to make the application of the rules a sort of second nature, even if the theory on which they are based be afterward forgotten.

Time was when drawing masters believed that a course in mechanical perspective should be followed before attempting to draw objects freehand. There is something in this old idea. If a student could draw a cube, for eaxmple, in mechanical perspective—carrying all lines out to their proper vanishing points—they believed (and very properly) that his freehand drawing of the same cube would be more likely to be correct. The better plan is to carry on freehand and mechanical perspective together; for each helps the other, especially if the student is taught to apply in his freehand work the principles illustrated by his course in mechanical drawing.

This course in mechanical perspective is planned for students of the high school age who have already received some training in mechanical drawing, enough, at least, to understand Plates I and II.

It is given the title of "Simplified Mechanical Perspective," as the attempt is made to consider the essentials that will develop the perspective sense and enable the student to apply his knowledge to practical problems.

It is thought that in no other work on perspective is the practical application of the subject to interesting and everyday problems made so direct.

The first installment of problems is considered as introductory; the second will consider the perspective of furniture, interiors of rooms, and the perspective of roofs, cornices, chimneys, etc.; the third will treat of circles, arches, etc.; and the fourth, the perspective of oblique lines.

THE PERSPECTIVE DIAGRAM.

In Fig. 1, Plate I, line A-B represents a horizontal plane upon which a spectator is standing. The distance between the point marked E. (Eye) and the point marked S.P. (Station Point) represents the distance the spectator's eye is above the horizontal plane.

The spectator is supposed to be looking at a cube the plan of which (a-b-c-d) is seen in Fig. 2.

An imaginary vertical plane, at right angles to the direction in which the spectator is looking, is placed in front of the cube. This plane shows in Fig. 1 as a vertical line—the edge view of the plane—and in Fig. 2 as a line upon the horizontal plane—its top view, or plan, called the trace of the vertical plane (Tr. V. Pl.)

Visual rays pass from the eye to the corners of the cube and intersect the vertical plane as seen in Figs. 1 and 2. If these points of intersection should be connected by lines a *perspective* of the cube would by obtained upon the vertical plane.

As it is not practicable to draw upon this vertical plane, a nearer plane called the picture plane (P. Pl.) is placed at any convenient distance from the spectator—as the picture plane in Fig. 3, shown in Fig. 4 by the picture line (P. L.)—the line of intersection of the picture plane and the horizontal plane.

If the points of intersection of the visual rays with the vertical plane are projected to the picture plane, the perspective upon the picture plane will be the same as the perspective upon the vertical plane. Thus, in Fig. 4, d-e is the same as a-b the apparent length of b-g, and e-f is the same as b-c the apparent length of b-h.

A horizontal plane passing through the spectator's eye, Fig. 1, intersects the vertical plane in a horizontal line, the horizon, not seen in Figs. 1, 2 and 3 as it is upon the vertical plane. Its position may be found, however, by projecting, by line 1-2, Fig. 3, its distance above the horizontal plane to the picture plane, and then revolving it (with point R as center) to coincide with the horizontal plane. It is then seen as in Fig. 4. This revolution of the horizon (H) from its position upon a vertical plane to a horizontal plane is necessary in order that the horizon may be upon the same plane (as a sheet of paper) as the picture line, the trace of the vertical plane, and the station point.

The point directly opposite the eye on the vertical plane in the horizon is called the center of vision, seen in Fig. 2, at C. V. The line connecting the S. P. with the C. V., Fig. 2, is called the line of direction (L. of D.)

The points and lines so far found constitute the perspective diagram, Fig. 5, Plate II.

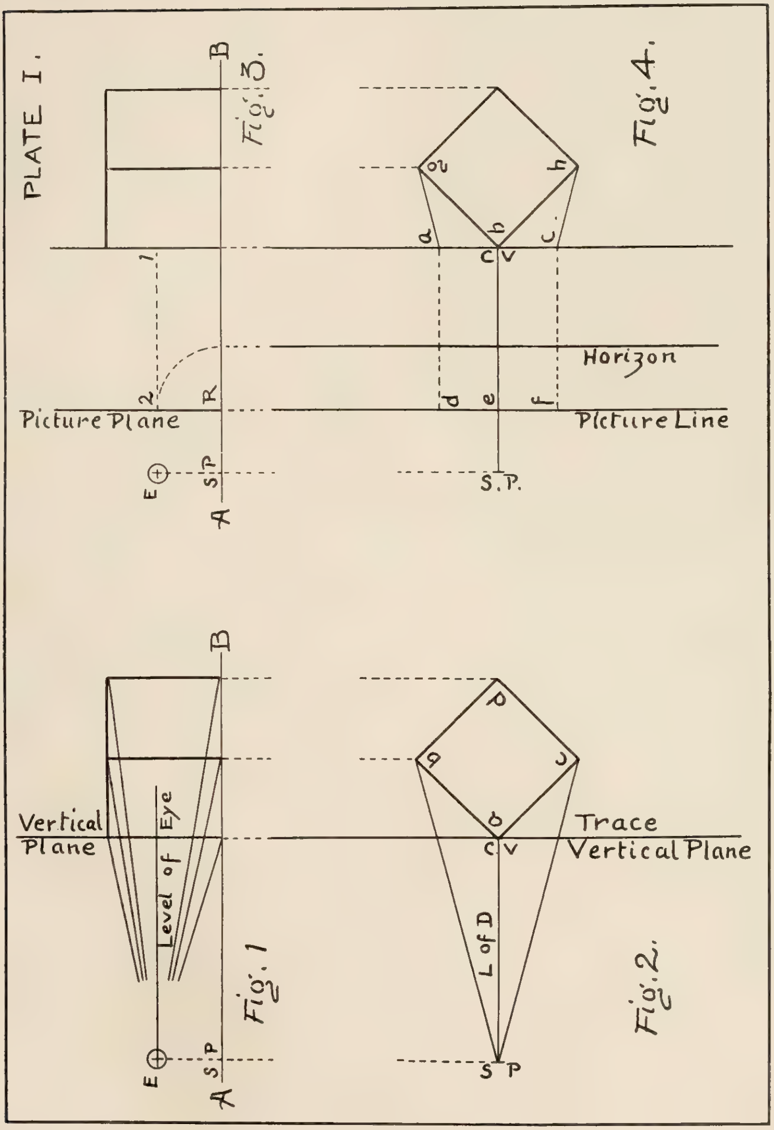


PLATE I.
Fig. 3.
Fig. 4.
B
A
S.P.
E
R
1
2
Picture Plane
Horizon
Picture Line
a
b
c
d
e
f
g
h
C V
S.P.
Fig. 1
Fig. 2.
Vertical Plane
Level of Eye
Trace Vertical Plane
L of D
S P

TO LAY OUT A PERSPECTIVE DIAGRAM.

When laying out a perspective diagram upon which a perspective is to be drawn, the first thing to determine is the scale—a quarter, half, or inch to the foot, depending upon the size of the object to be drawn and its distance from the spectator. The first point to locate is S. P. In the problems to follow each S. P. is located in its relation to the margin line of a plate laid out as in Fig. 8. Thus "S. P. 22′0″ to right and 2′0″ above" means 22′0″ to the right of the left margin line and 2′0″ above the lower margin line. After S. P. is located, draw a line to represent the L. of D., Fig. 5, and set off on it, from S. P., the distance C. V. is from S. P., and draw through C. V., at right angles to L. of D., the Tr. V. Pl. P. L. is placed wherever convenient—generally at or near S. P. H. is placed as far above P. L. as the eye is supposed to be above the level of the base of the object to be drawn, or as far below P. L. as the base of the object to be drawn is supposed to be above the level of the eye.

TO FIND VANISHING POINTS.

In working a problem first place the plan at the required angle with Tr. V. Pl., as the square A-B-C-D in Fig. 6, and find the vanishing points of the retreating or vanishing lines.

To find the vanishing point (V. P.) of any system of lines (lines that have the same direction), follow the direction of any one line (or element) of the system till its point of intersection with the vertical plane is found. This point will be the V. P. of the entire system. The vanishing points of all horizontal systems not parallel to the vertical plane are in the horizon.

To find the V. P. of A-D and B-C, Fig. 6, draw a line from S. P. parallel to these lines (in this case at an angle of 45° with Tr. V. Pl.) to cut the Tr. V. Pl. Point X is found to be the V. P. of the system of which A-D and B-C are two elements, and point Y the V. P. of the system of which A-B and D-C are two elements. These points (X and Y) are projected to H. at V. P. R. (vanishing point right) and V. P. L. (vanishing point left) and become the vanishing points to be used in working the problem. They are projected to H. in order that their distance from the horizontal plane may be known.

After the vanishing points are found, draw the visual rays from the corners of the plan, centering at S. P., but drawn only to Tr. V. Pl., in order to obtain the apparent length of lines in the plan as explained in connection with Fig. 4, Plate I.

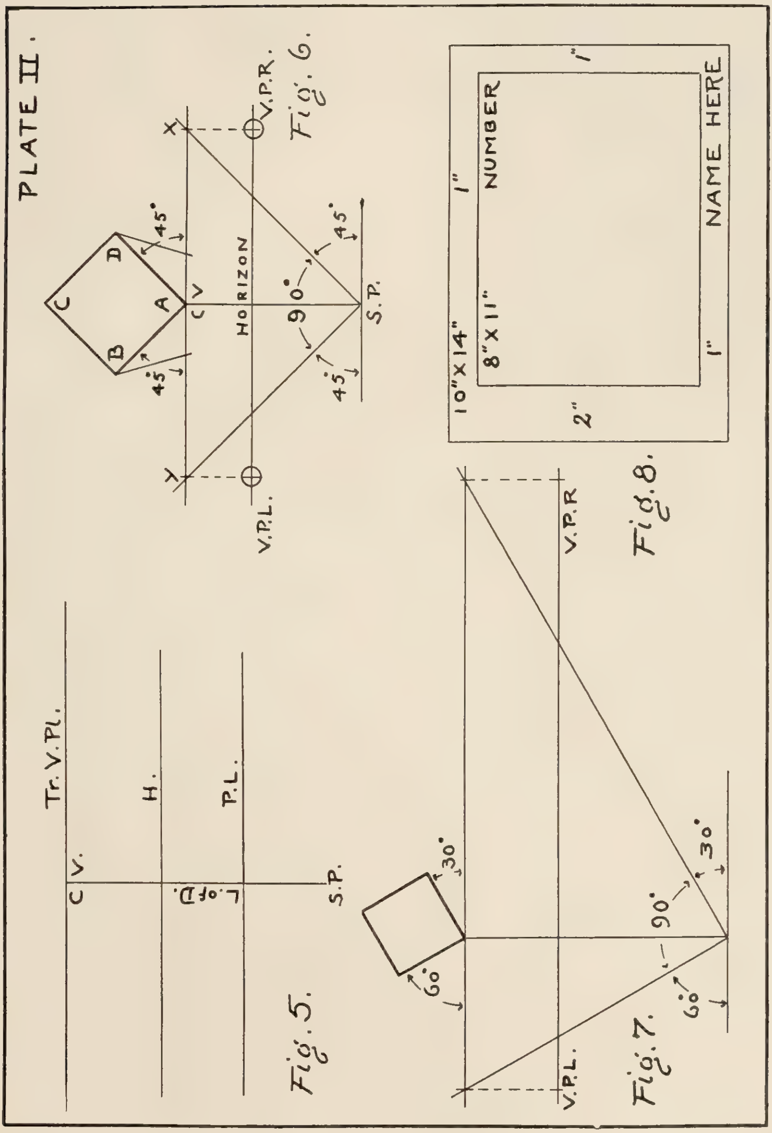
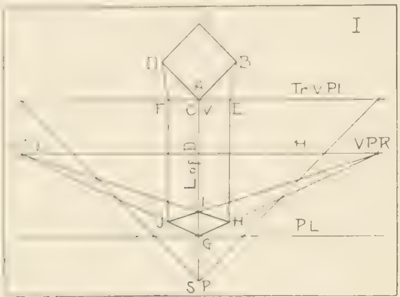


PLATE II.
Fig. 5.
Tr. V. Pl.
H.
P.L.
C V.
L. of D.
S.P.
Fig. 6.
A
B
C
D
45°
90°
C V
HORIZON
S.P.
X
Y
V.P.R.
V.P.L.
Fig. 7.
30°
60°
90°
V.P.R
V.P.L.
Fig. 8.
10"X14"
8"X11"
NUMBER
NAME HERE
1"
2"

PROBLEMS.*

PROBLEM I.

This problem illustrates the method of drawing, at a scale of ¼″ =1′0″, the perspective of a square (6′0″x6′0″) that is on the horizontal plane, with sides making angles of 45° with Tr. V. Pl., 20′0″ from S. P. and 9′0″ below the eye.



The statement of the diagram is: Scale ¼″=1′0″. S. P. 22′0″ to the right and 2′0″ above. C. V. 20′0″ from S. P., P. L. 5′0″ from S. P., H. 9′0″ above P. L.

After the diagram is complete, draw the square (A-B-C-D), find V.P.R. and V.P.L., and the points of intersection with Tr. V. Pl. of the visual rays from S. P. to its corners (points F.A.E.)

As point A in the plan is against Tr. V. Pl., point G of the perspective will be against P. L. Draw G—V. P. R. and project point E to point H. G-H is the perspective of A-B. Draw G—V. P. L. and project point F to point J. G-J is the perspective of A-D. Draw

*NOTE TO TEACHERS:—Instructors should prepare original problems, to follow each problem here given, that their pupils may thoroughly understand all principles and methods. Students may be assigned problems to work on the blackboard, as problems in geometry are often demonstrated before the class.

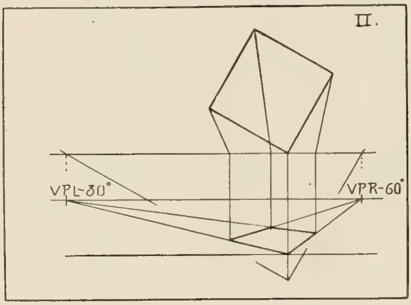
The writer has found that some of the strongest students in perspective seem, at first, unable to comprehend the subject—working the problems by "rule of thumb"—but when real objects or rooms were to be drawn, the whole theory has seemed to dawn upon them, in some cases in a moment. Therefore the teacher should not feel discouraged if some students are slow to grasp the subject.

It is the writer's opinion that the study of mechanical and freehand perspective should be carried on at the same time. Every problem in this course, with the exception of the first six, should be followed by a freehand exercise. For example: After working Problem VII a similar prism should be placed before the class to be drawn freehand. After problem XV a similar table should be drawn freehand.

In the public schools students will have drawn boxes, books, tables, chairs, etc., for years before they are old enough to attempt this or any course in mechanical perspective. They should, however, combine the study of freehand with mechanical perspective for in their earlier work they have drawn without the sureness and accuracy that is developed by the study of mechanical perspective.

J—V. P. R. and H—V. P. L., and their point of intersection, I, is the perspective of point C. G-H-I-J is the perspective of A-B-C-D.

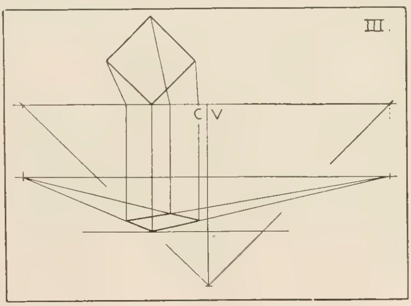
The plan may be placed at any angle with Tr. V. Pl., and its vanishing points found as illustrated above. In Fig. 7, Plate II, a square is so placed that two sides make angles of 30° and two 60°. In Problem II the V. P. R. of lines at 60° and the V. P. L. of lines at 30° must be found as illustrated in Fig. 7.



PROBLEM II.

Scale ¼″=1′0″. S. P. 31′0″ to the right and 2′0″ above. C. V. 14′0″ from S. P., P. L., 3′0″ from S. P., H. 6′0″ above P. L.

In this problem a 10′0″x10′0″ square is so placed that the right side makes an angle of 60° with Tr. V. Pl., and the left side an angle of 30°. The perspective, though correct, appears distorted because the spectator (S. P.) was placed too near so large a square. Distortion of the perspective will also result if the plan is placed too far to the right or left of C. V. It may, however, be placed a short distance to right or left of C. V. without serious distortion as shown in Problem III.



PROBLEM III.

Scale ¼″=1′0″. S. P. 22′0″ to right and 1′6″ above. C. V. 20′0″ from S. P., P. L. 6′0″ from S. P., H. 6′0″ above P. L.

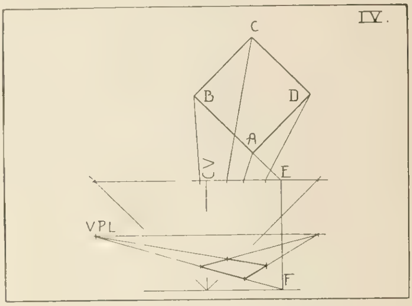
In this problem a 7′0″x7′0″ square, with sides making angles of 45° with Tr. V. Pl., is so placed that its nearest corner is 6′0″ to the left of C. V.

PROBLEM IV.

Scale ¼″=1′0″. S. P. 22′0″ to right and 1′0″ above. C. V. 12′0″ from S. P., P. L. at S. P., H. 6′0″ above P. L.

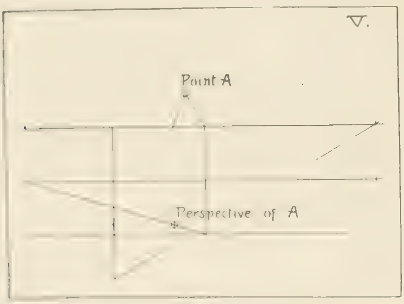
This problem illustrates the method of putting into perspective

a plan that is beyond the vertical plane. The square is 9′0″x9′0″, and is placed 5′0″ to the right of C. V. and 3′0″ beyond Tr. V. Pl. Continue side B-A to cut Tr. V. Pl. at E. Project E to P. L. at F. Draw F—V. P. L., and find the perspective of B-A in line F—V. P. L. Having located in perspective one side of the square, the three remaining sides can be found as in the foregoing problems. If corner A had been in line with the L. of D. the intersection of line F—V. P. L. with the L. of D. would have been the perspective of corner A.



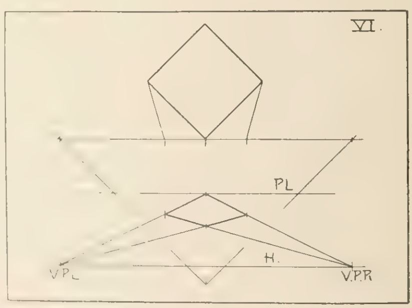
PROBLEM V.

Scale ¼″=1′0″. S. P. 12′0″ to right and 2′0″ above. C. V. 17′0″ from S. P., P. L. 5′0″ from S. P., H. 6′0″ above P. L.



Any point on the horizontal plane may be put into perspective (as point A placed at random) by considering the point as the end of a line drawn to cut Tr. V. Pl. at any convenient angle—in this case an angle of 60° to the left. Putting the line into perspective we find, of course, the perspective of its end —as point A.

After finding the perspective of point A as described above, find it by considering the same point as the end of a line making an angle of 30° to the right.

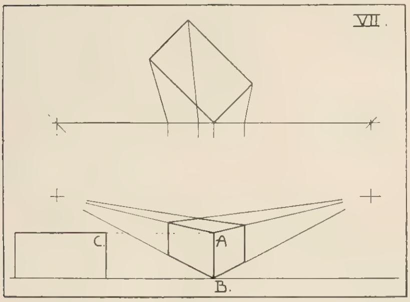


PROBLEM VI.

Scale ¼″=1′0″. S. P. 22′0″ to right and 2′0″ above. C. V. 16′0″ from S. P., P. L. 10′0″ from S. P., H. 8′0″ below P. L.

In this problem a square, 9′0″x9′0″, is above the level of the eye and therefore H. is placed as far below P. L. as the square is supposed to be above the level of the eye.

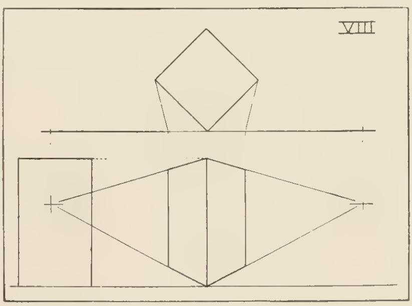
When problems are lined-in with ink, the lines drawn at the given angles from S. P., the line of direction and horizon line may be omitted, to avoid confusion, as only the points obtained by these lines are necessary for the working of the problems. (See Problems VII-XII.)



PROBLEM VII.

Scale ¼″=1′0″. S. P. 23′0″ to right and 2′0″ above. C. V. 17′0″ from S. P., P. L. at S. P., H. 9′0″ above P. L. In this problem a rectangular solid 6′0″x5′0″x10′0″ rests on one 6′0″x10′0″ face, with sides vanishing to right and left at 45°. The plan is placed as in the foregoing problems. One elevation, all that is needed to secure the height of the solid, is placed upon P. L. at one side of the problem.

The nearest vertical edge of this solid rests against the vertical plane and therefore its perspective will be upon the picture plane. The true length of this edge (5′0″) may be set off at A-B, or projected from the elevation by line C-A.



In this system of perspective all heights are secured from elevations; and all heights (as in any system of perspective) must be measured or located upon the picture plane, for there only do they appear of their true length.

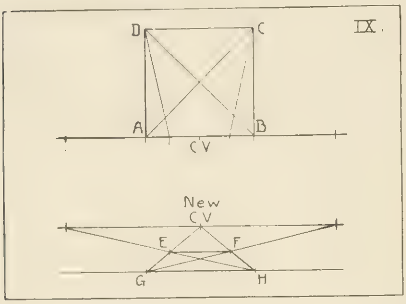
PROBLEM VIII.

Scale ¼″=1′0″. S. P. 22′0″ to right and 2′0″ above. C. V. 17′0″ from S. P., P. L. at S. P., H. 9′0″ above P. L.

In this problem a square prism, base 8′0″x8′0″, altitude 14′0″, with sides vanishing to right and left at 45° is drawn. The lower base is upon the horizontal plane, the upper is above the level of the eye. Its height is found as in Problem VII.

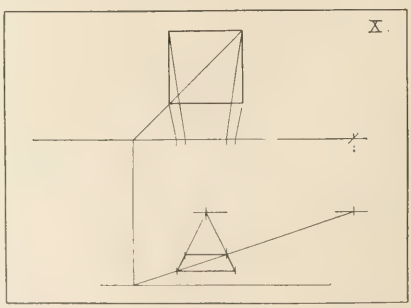
PROBLEM IX.

Scale $\frac{1}{4}''=1'0''$. S. P. $22'0''$ to right and $3'0''$ above. C. V. $15'0''$ from S. P., P. L. at S. P., H. $5'0''$ above P. L. In this problem a square, $12'0''\text{x}12'0''$, one of whose sides (A-B) rests against Tr. V. Pl., is drawn. Sides A-D and B-C make with Tr. V. Pl. angles of V. Pl., is drawn. Sides A-D and B-C make with Tr.V.Pl. angles of 90°. To find their V.P. draw from the S. P. a line parallel to them to cut Tr. V. Pl. This V. P. is found to coincide with C. V. Projecting this V. P. to H. (as other vanishing points are projected) the point marked New C. V. is found. This point is the V. P. of the system of which lines A-D and B-C are two elements.



The perspective of the square in this problem can be drawn in the usual manner, or by the use of diagonals. As diagonal A-C makes an angle to the right of 45°, it will, if put into perspective, cut line H-New C. V. at F and make H-F equal to H-G., and diagonal B-D, if put into perspective, will locate D in perspective at E.

In Problems I, III, IV, and VI one diagonal of the perspective will be a horizontal line and the other will vanish at the New C. V. The perspective of the center of any rectangle in perspective may be found by drawing its diagonals.

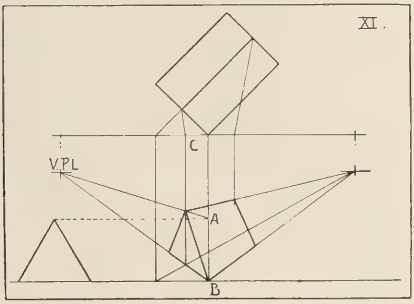


PROBLEM X.

Scale $\frac{1}{2}''=1'0''$. S. P. $11'0''$ to right and $1'0''$ above. C. V. $8'0''$ from S. P., P. L. at S. P., H. $4'0''$ above P. L. In this problem a square, $4'0''\text{x}4'0''$, with two sides parallel to Tr. V. Pl., is $2'0''$ beyond the vertical plane. Its perspective is obtained by applying the method of finding points beyond the vertical plane illustrated in Problems IV and V.

PROBLEM XI.

Scale ¼″=1′0″. S. P. 22′0″ to right and 2′0″ above. C. V. 16′0″ from S. P., P. L. at S. P., H. 12′0″ above P. L. In this Problem an equilateral trangular prism rests on one 8′0″x11′0″ face as shown by the plan. The altitude of the triangular base is put into perspective by projecting it to A-B., drawing A—V. P. L., and projecting point C to cut A—V. P. L.

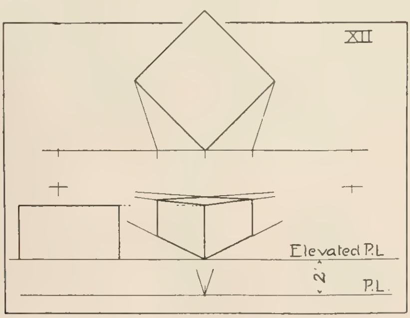


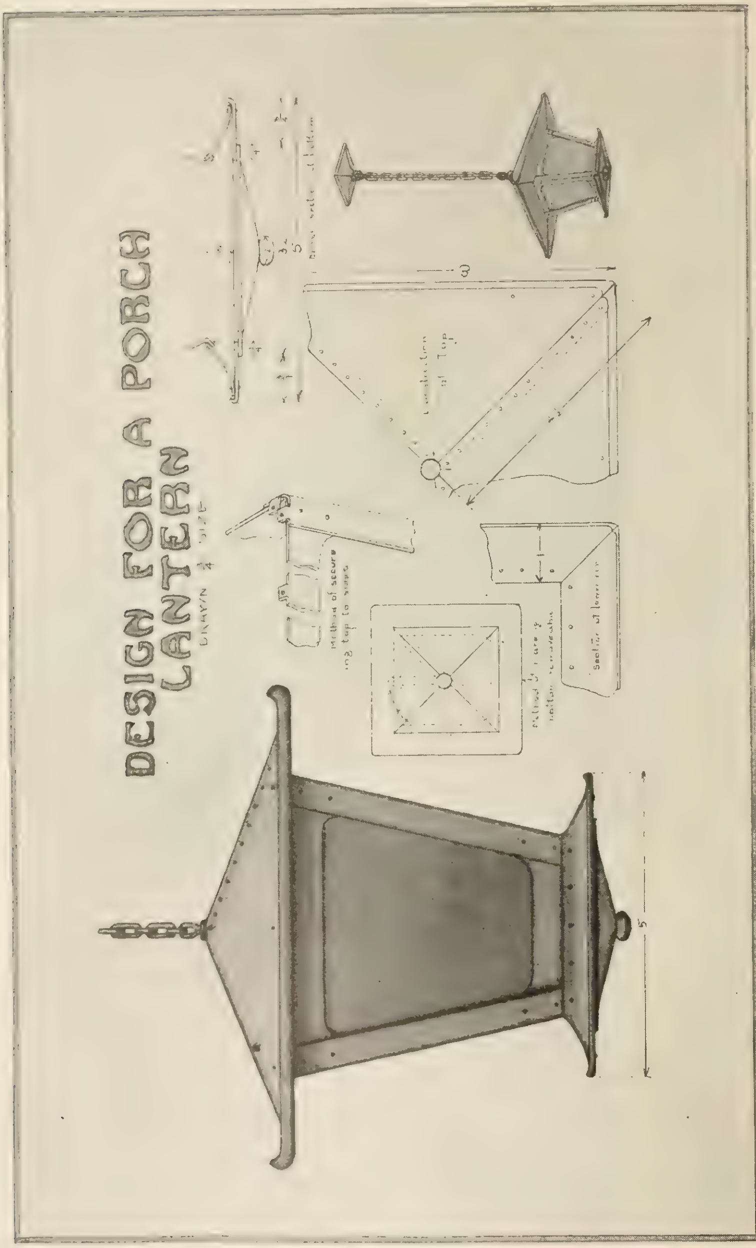
The visible triangular base of the prism is included in a vertical plane vanishing to the left. Therefore any vertical distance in this plane must be first set off on the intersection of this vertical plane with the picture plane (as A-B) and then carried into perspective.

PROBLEM XII.

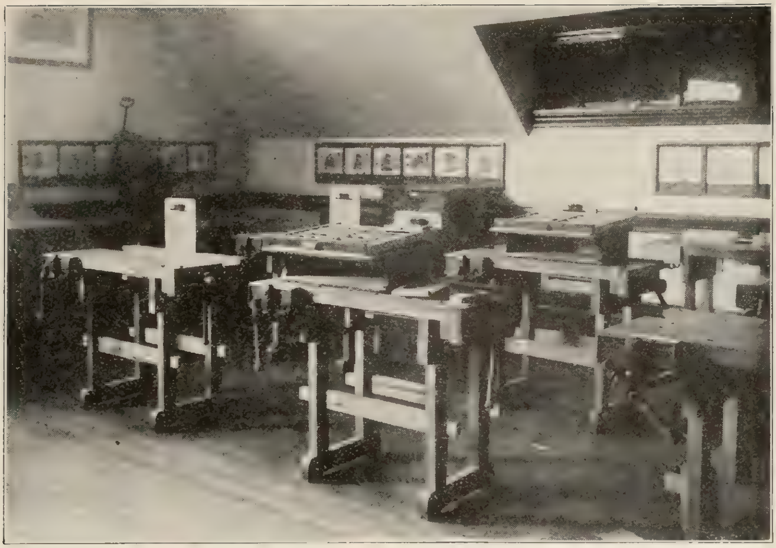
Scale ½″=1′0″. S. P. 11′0″ to right and 1′0″ above. C. V. 8′0″ from S. P., P. L. at S. P., H. 6′0″ above P. L. In this problem a square plinth 5′6″x5′6″, altitude 3′0″, with sides at 45°, is 2′0″ above the horizontal plane. As the lower base is 2′0″ above the horizontal plane, an elevated picture line, (El. P. L.) 2′0″ above P. L. may be used. Whenever a horizontal surface, that is not the upper base of an object on the horizontal plane, is to be put into perspective it is well to use an El. P. L.

(To be continued.)





DESIGNED BY FRED C. HUGHES, SUMMER SCHOOL, BRADLEY POLYTECHNIC INSTITUTE.



WOODWORKING SHOP USED FOR PRINTING, HORACE MANN SCHOOL, NEW YORK CITY.

PRINTING IN A MANUAL TRAINING SHOP.

EGBERT E. MACNARY.

THE text and reproduced pages following this note, are from an eighteen page booklet, printed by an eighth-year class of twenty-five boys, in the Horace Mann School, New York. The subject assigned for the year was Communication, and ended with the printing of this booklet, involving typesetting, zinc etching, making chalk-plate cuts, and press work.

An illustration is given here of how the cases of type were accommodated on the benches, and also one of the printing press and type cabinets. Twelve cases of Old Roman Post No. 2 type were provided, and two boys worked on each case. The drawings shown give an idea of the printers' "stick" and the "galley" that each boy made.

The press used was a large hand-lever press, costing $60, and the twelve cases with type and dust-proof cabinet cost $50. An equipment suitable for conducting a simple course in printing could be provided for $120.

The zinc plate used for etching was the regular photo-engravers' zinc, and the wax was made by melting paraffine with a little floor wax.

The tool used in scratching around the letters was made by driving a 1¼″ brad in the end of a piece of ½″ dowel, 4″ long, and filing the head to a point. This tool also served in drawing on the chalk-plates.

Materials for making the chalk-plate cuts are supplied by the Hoke Engraving Co., St. Louis. Directions for making these cuts are furnished with the materials.

Printing, as a subject by itself, may be profitably taken up by a class, during the shop periods of an entire year, instead of part of a year, as was done in this case. The subject is quite adaptable to school conditions, and especially suitable for the eighth-year boy. The subject covers considerably more than type-setting. There are the various methods of illustrating, reproducing, and binding that may be worked out. In this case, zinc-etching, and the chalk-plate process were employed (the half-tone cuts were made outside), but there are many other processes that might be taken up along the lines of engraving, lithographing, stereotyping, electrotyping, etc. From the writing of a text, to the finishing of a binding, cooperation with other lines of school work, particularly the English and Art departments, is encouraged in a most natural manner.

It might be mentioned here, that in the Horace Mann School, this printing equipment is not only used by the eighth-year class for scheduled work, but plays quite an important part in the development of class and school spirit, particularly in the high school, in connection with the social activities of the school. Ballots for class elections, programs and tickets for plays, dance cards, posters, subscription blanks, etc., form part of a list of items printed by the high school boys during the year.

Following is the text of the booklet, with a few pages reproduced to show the type, half-tones, zinc-etched initial letters, and the chalk-plates. The cover was brown, and the leaves were sewed together with brown silk. The paper had an ivory tint, and was slightly glazed.

Shop Work of the First Year High School Boys (8th Year), Horace Mann School, New York.

THE COURSE OF STUDY.

The subject of Communication is taken up in the First Year High School shop work following the study of Manufactures and Transportation in the sixth and seventh grades. The detail projects worked out center around the Telegraph, the Telephone, and Printing.

PRINTING PRESS AND CASES OF TYPE.

The first half year is devoted to making telegraph sounders and keys, microphone transmitters, and telephone receivers. A few boys who had instruments previous to taking up this work, devoted the time to making recorders.

While constructing the telegraph each boy learned the Morse code and practiced sending and receiving messages.

This booklet constitutes the results of the work of the second term, in printing. Outside of making the half-tones, all of the work was done in the shop, with the exception of the designing and drawing, which was carried out in the art studio.

The details of how this work was done are described in the following pages.

THE TELEGRAPH.

Making a telegraph sounder and key proved to be an intensely interesting project to the First Year boys. The principle of the electromagnet was first taught to the class, and then essential parts of a sounder were discussed.

The boys were given free choice as to the design of their sounders and of the material to be used. The majority of the class made wood

patterns of the parts, moulded them in sand on a moulding bench provided for the purpose, and cast them in the type metal. The anvil, sounding bar, and supports were made in this way.

Various substitutes were used by the boys, such as wood faced with sheet metal or, the heavy parts were filed out of heavy sheet metal. Most of the magnets were taken from discarded electric bells.

Keys were made of strip metal with binding posts or screws for contacts, and a switch was attached, made of a window catch, or metal strip.

While the instruments were in process of construction, the boys learned the Morse code, and were given practice in sending and receiving messages.

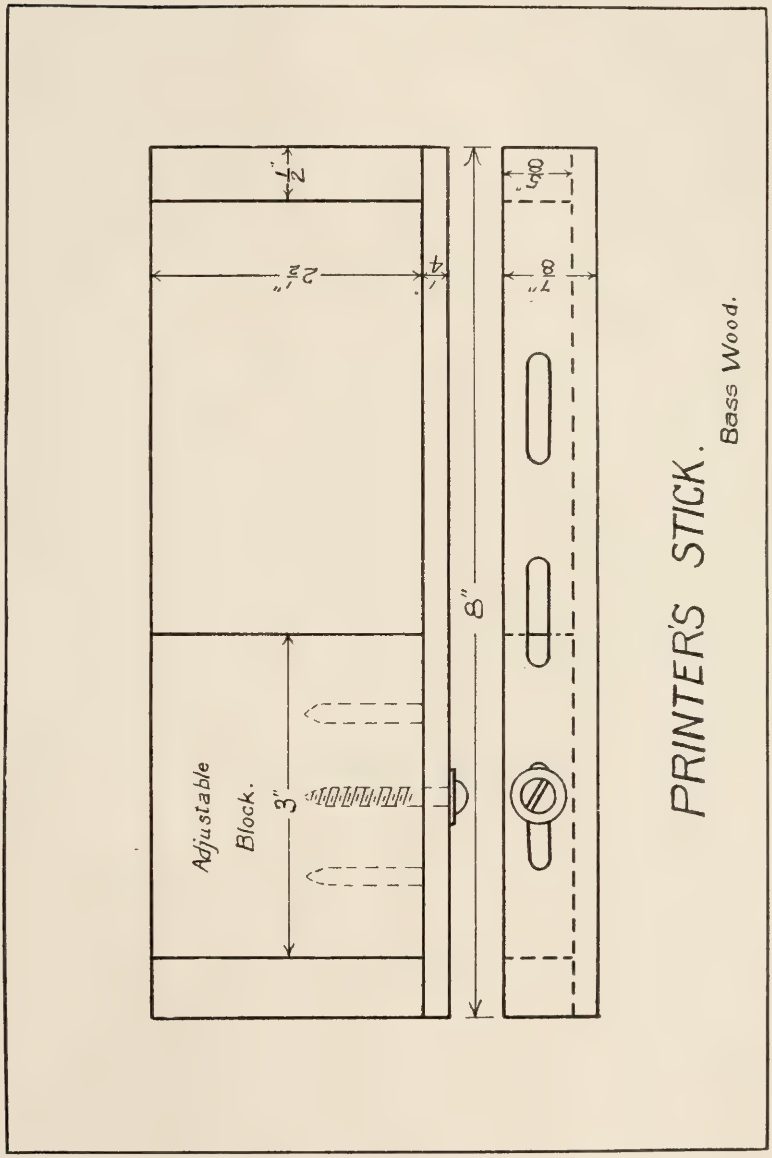
THE TELEPHONE.

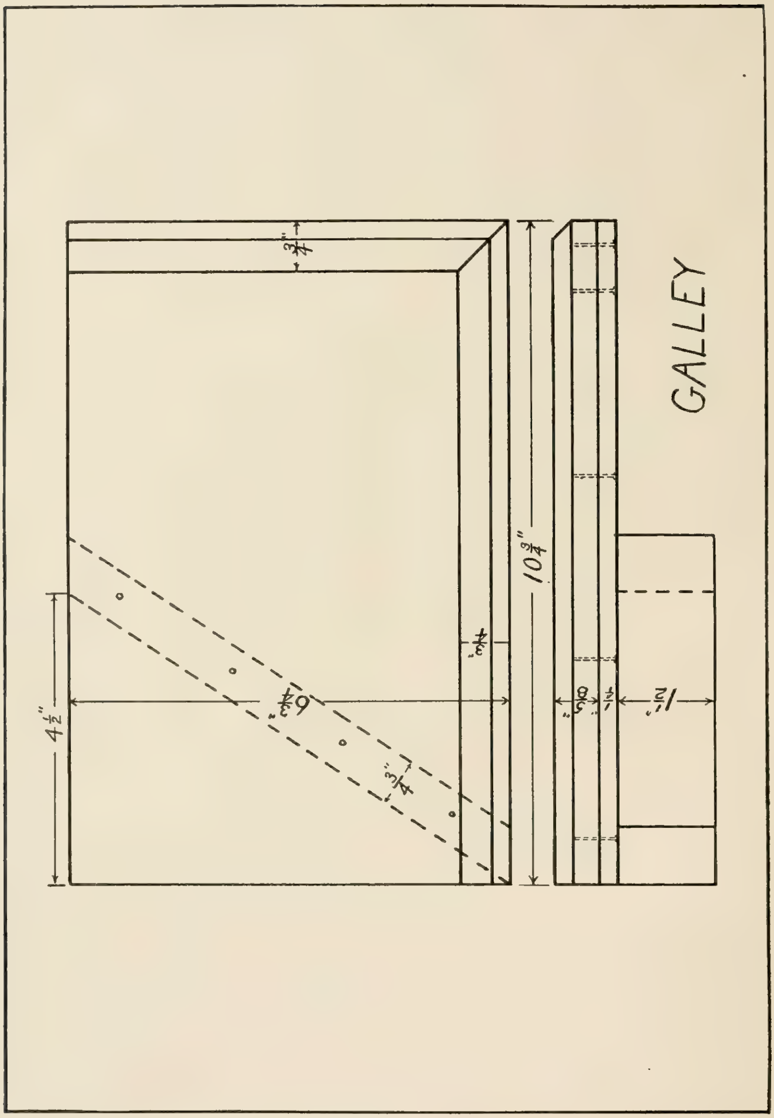
Following the telegraph, each boy was given the problem of making a microphone transmitter and a receiver. The woodwork of the microphone consisted of a thin mahogany upright gained into a base. Mounted on the upright were two pieces of carbon secured from an old battery, or from an electric lamp. These were filed square in section and fastened to the upright by means of wire or screws. The lower carbon was placed horizontally and the upper one at an angle. Four small holes were drilled about an eighth of an inch deep on the sides of the carbon that faced each other, and pencil leads were placed vertically in these holes so as to connect loosely the upper carbon with the lower. Binding posts were connected so that the circuit would pass into one carbon, through the pencil leads to the other carbon and on out.

The telephone receivers were made of horseshoe or bar magnets, with a fine wire coil wound on the end, and the magnets fastened in cylindrical boxes. A diaphram of ferrotype was placed over the end of the magnet so as to not quite touch it. By placing a watch near one of the microphones, a connected receiver would clearly reproduce the ticks.

PRINTING.

Our printing equipment is not an expensive one, but is sufficiently complete to permit a class of twenty-four boys to set type at one time. We have the largest size hand press made, and thirty-two cases of type in all. The press and a stone are placed on a flat top desk, the drawers of which are convenient for keeping the odd chases, sticks, furniture,


PRINTER'S STICK.
Bass Wood.
Adjustable Block.
8"
3"


GALLEY
10¾"
4½"
¾"
1½"

etc. The cases of type are kept in two dust-proof cabinets. As there is not room in the shop for "stands," class room desks tops with the irons removed are placed on the benches. These serve to hold the cases very satisfactorily, and can be piled in a corner out of the way at the close of the lesson.

CHALK PLATES

CHALK plates as well as the zink etchings, depended very largely on the work done in the Art Studio for their sucessful completion. Before anything could be done on chalk plates at all, very careful drawings were required to be made first. The subjects chosen to be drawn were reduced drawings of the telephone and telegraph instruments that were made during this course, and the results are shown on the next few pages. When each boy had actually made a drawing good enough for reproduction, he was given a chalk plate on which he was to trace his drawing. These chalk plates are thin steel plates with a layer of chalk about one eighth of an inch thick on them. The drawings or pictures are scratched into the chalk down to the steel, the plate is

PAGE OF STUDENTS' PRINTING, FULL SIZE, SHOWING ZINC ETCHING OF INITIAL AND STYLE OF TYPE.

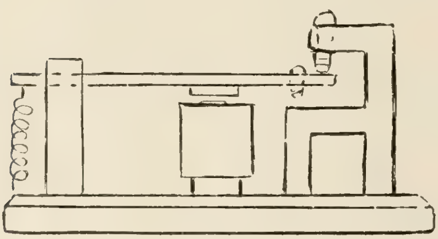
Printers' "sticks," used for setting the type, were made of wood, but patterned after the usual sheet metal form. Galleys were also made of wood.

This work afforded some opportunity for construction although the aim of this course was not to give bench work projects based on the subject of printing, but rather to give some real experience with various operations and processes used in printing.

ZINC ETCHING.

All of the initial letters employed in printing this booklet were made by the boys previous to setting up the type. Each boy made his own initials, and the appropriate letters were chosen from the assortments thus made up. Several periods were spent in the art studio learning to design a simple alphabet.

then placed in a mold,and a casting is made in stereotype metal This casting is the cut used in the press along with the type. The tools used for scratching of the chalk and the metal mold for making the castings were made by the boys in the shop.



Telegraph Sounder.

PAGE OF STUDENTS' PRINTING, FULL SIZE, SHOWING CHALK PLATE ILLUSTRATION.

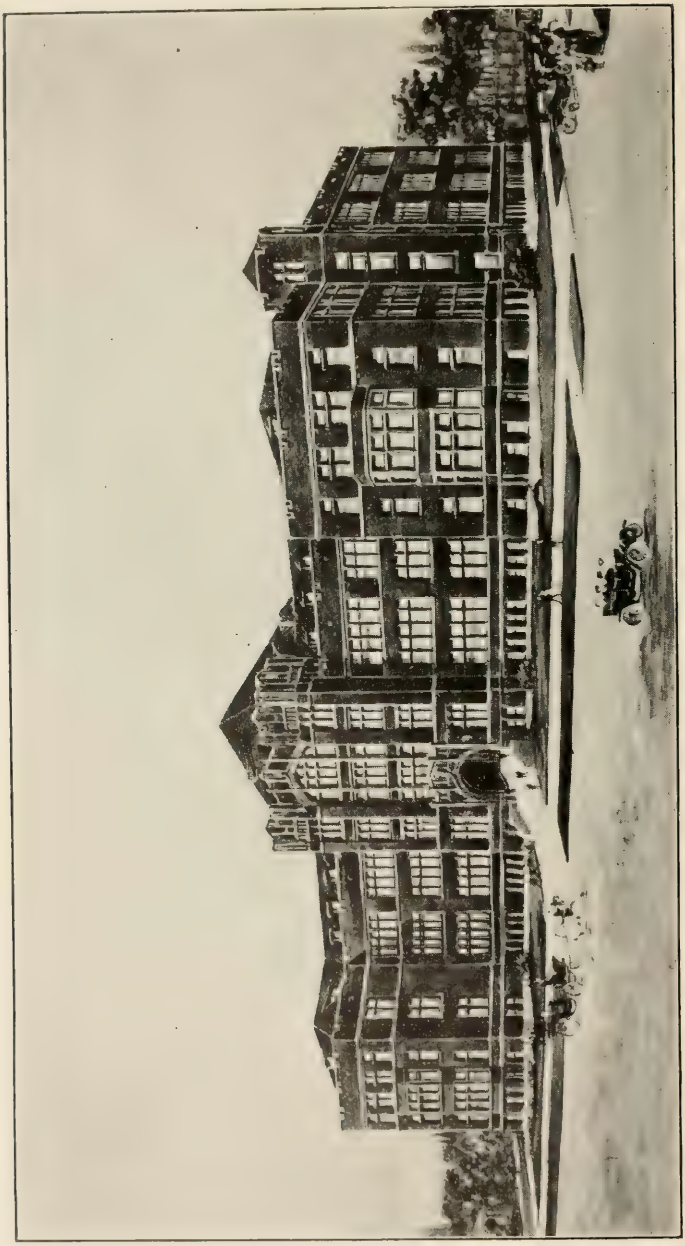
As soon as the boys were able to draw suitable letters, they were given small pieces of zinc plate on which reversed tracings of the letters were made. The plates were then dipped in hot wax, cooled, and the wax was scraped off where there was to be no image.

The plate was then placed in a bath of dilute nitric acid and the plate was etched, leaving the letter raised above the etched surface.

The plates were then mounted on blocks so as to make them "type high." They were then set up with the type and run through the press.

CHALK PLATES.

Chalk plates as well as the zinc etchings, depended very largely on the work done in the Art Studio for their successful completion. Before anything could be done on chalk plates at all, very careful drawings were required to be made first. The subjects chosen to be drawn were reduced drawings of the telephone and telegraph instruments that were made during this course, and the results are shown on the next few pages. When each boy had actually made a drawing good enough for reproduction, he was given a chalk-plate on which he was to trace his drawing. These chalk-plates are thin steel plates with a layer of chalk about one eighth of an inch thick on them. The drawings or pictures are scratched into the chalk down to the steel, the plate is then placed in a mold, and a casting is made in stereotype metal. This casting is the cut used in the press along with the type. The tools used for scratching the chalk and the metal mold for making the castings were made by the boys in the shop.



NEW TECHNICAL HIGH SCHOOL, CLEVELAND, OHIO.

THE NEW TECHNICAL HIGH SCHOOL AT CLEVELAND.

JAMES F. BARKER.

CLEVELAND is building a large technical high school—a school not planned upon the lines of any educational institution at present in existence in the United States. It is not a manual training high school, neither is it a trade school, though it is closely allied to each.

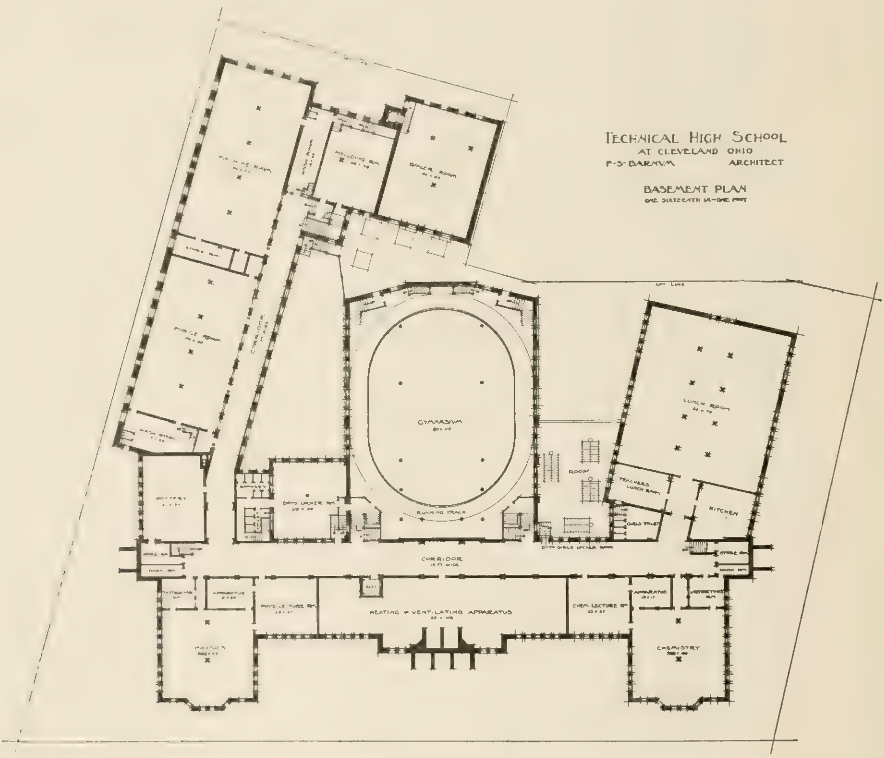
The design of the building is English Gothic and is executed in a dark reddish brown shale brick with brown terra cotta trimmings, resting upon a heavy cut stone water table. The front is divided by the projections of the end wings and the central pavilion into most pleasing and harmonious proportions. The plan is like the letter "E" in form, there being three wings abutting upon the main building, which has its facade toward the east.

The front entrance is approached by an imposing flight of granite steps. Upon entering the building at the front access is had to the main corridor leading both north and south and into the wings over this entire floor. At the right is located a reception room and at the left the offices of administration. Immediately opposite the entrance is a spacious auditorium with a seating capacity, including main floor and balcony, of thirteen hundred, available for school assemblages and popular evening lecture courses. Provision is being made to accommodate one thousand day students.

In the north wing the entire area has been devoted to a lunchroom with the necessary kitchens, serving rooms, etc. Immediately under the auditorium are the gymnasium, running tracks, showers and locker rooms. The south wing has been devoted to the shops on this floor as well as upon the first floor. The pottery department will be equipped with potters' wheels, lathes for turning models, a slip house and glaze room set, kilns, etc. Adjacent to this is the forge shop with provisions for a blacksmith class of thirty-six. The forges will be arranged for down draft and the equipment thoroughly modern and up to date in every respect.

The next room is the machine shop with heavy equipment suitable for the very best of trade instruction. Located at the end of the corridor is a foundry provided with a cupola for the melting of iron, a

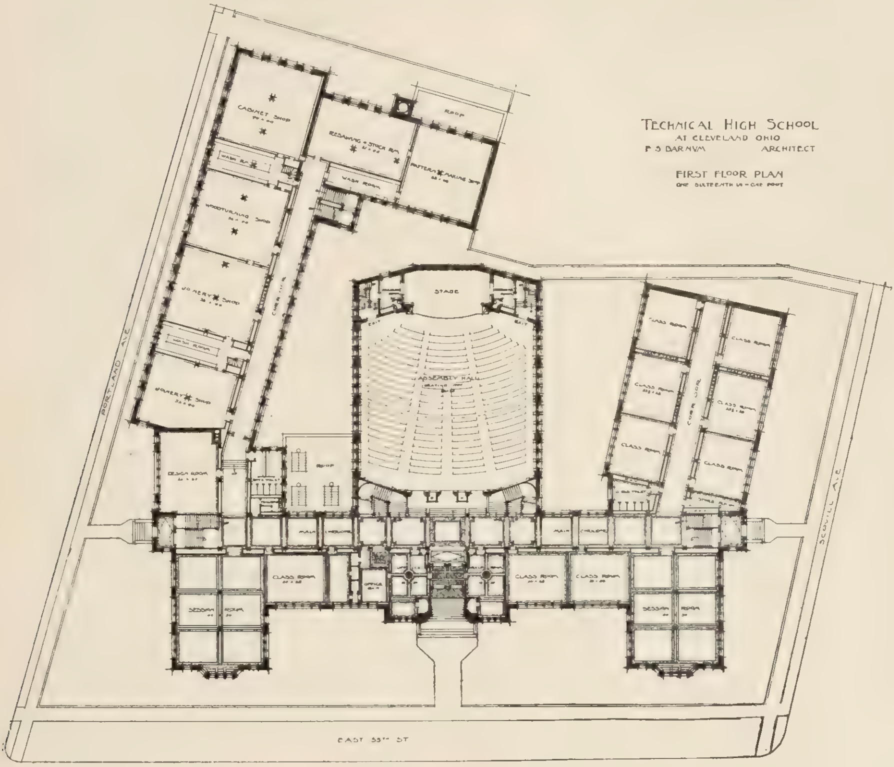
brass furnace, suitable core ovens, etc. At the extreme back of the building the heating and power plant has been installed where it is proposed to generate heat and electric light power. This plant will have a capacity of over 400 horse power.



On the first floor in the main part of the building and also in one of the wings the rooms will be devoted to recitations. Two large rooms at each corner of the building, with a seating capacity of 250, have been set aside for session rooms in order that the pupils may have an undisturbed opportunity for study.

In the other wing are five woodworking rooms, including joinery, turning, cabinet-making, pattern-making shops. There is also a room for re-sawing and storing stock. Modern methods make it essential that in addition to the usual hand tools in this room suitable woodworking machinery be provided.

Opposite to the entrance to the wing corridor is a draughting room for the use of students preparing designs for shop problems. This is easily accessible to all pupils in the woodworking department. There is also a room for varnishing and finishing woodwork. Adjacent to all

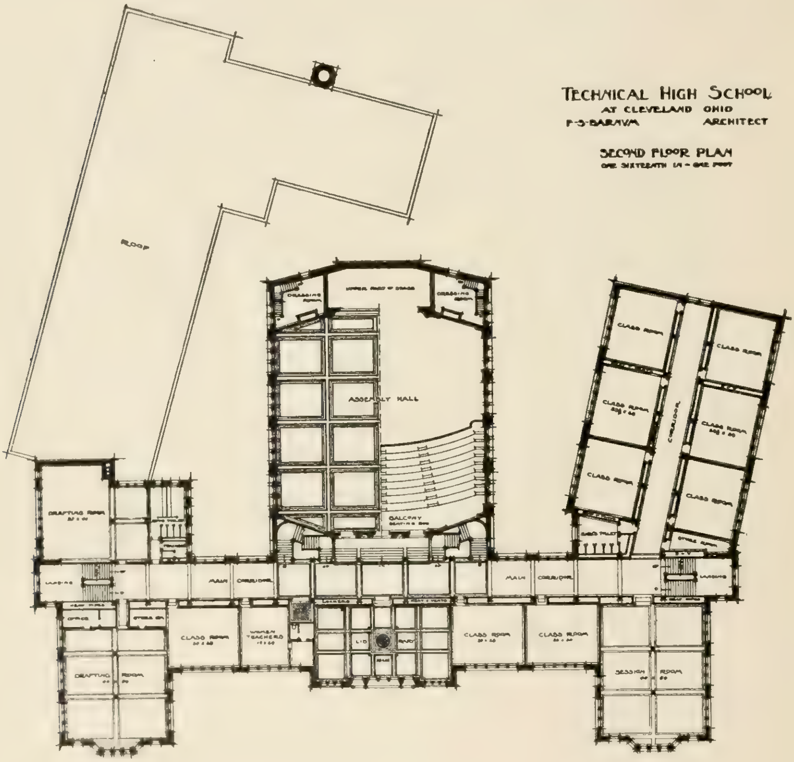


work shops are located wash rooms provided with individual lockers for the storage of working clothes, unfinished projects, etc.

On the second floor are additional recitation rooms, the school library, elementary science laboratory and mechanical drawing rooms.

On the third floor one wing is devoted entirely to the girls' department. Here are located the kitchens for instruction in cooking, the dining room for lessons in table service and the laundry. Rooms for instruction in plain sewing, dressmaking and millinery are situated at the corner of the building. Additional mechanical and freehand drawing, applied art and recitation rooms occupy the remaining floor space. A club room for school organizations, separate rest rooms for

women and for men teachers, are also given space in the building. No cloakrooms for the storage of wraps have been provided, this feature having been cared for by ventilated lockers conveniently distributed about the corridors.

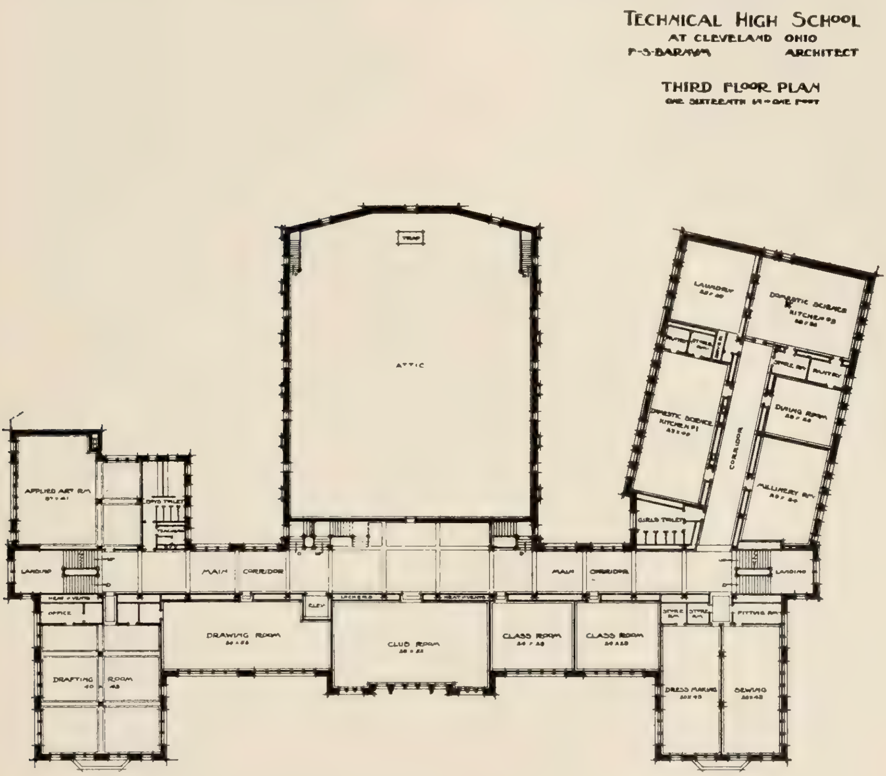


College entrance requirements cannot in any way enter into a determination of the outlines of this school's course. However, the preparation needed for admission to the colleges has already undergone radical revision and the industrial instruction afforded by this school has already received recognition as a college entrance requirement. Out of sixteen credits six may be manual and industrial training.

In the technical high school the atmosphere must be one of manufacture and industry, and upon these themes the academic studies are to bear with particular force.

High schools in the past have not taught very many subjects with a

definite view to their ultimate utility but have sought only general culture. In a school which trains for a vocation less attention can be paid to general education; subject-matter of a more specific nature must occupy the time and efforts of the students. Arithmetic, also algebra of



a very definite character dealing largely with shop problems, is essential; English, treating of industrial and labor problems, of manufacturing processes and distribution of the product, together with the study of the great industrial authors such as Carlisle, Ruskin and Wm. Morris, can well supplant the more purely literary authors. So also with German, which offers a fine field of technical reading; history can be taught along lines of industrial development; science can be applied science of the most intensive sort; and so on throughout the entire list of studies comprising the course. This means a radical departure from current high school practice and courses will not parellel those in the other high schools. So

large an amount of time will be devoted to shop practice and applied mechanical drawing that pupils entering this school from other high schools will be at a distinct disadvantage along these lines. The courses in manual training which remain in the present high schools must nevertheless be guided by the type of industrial instruction of the technical high school; this makes advisable the supervision of all high school manual training from this center.

During the last two years of the course pupils will be allowed to specialize along lines to which they are particularly adapted in order that upon graduation they may be better fitted for their life work. Some vocation must be chosen by a great majority of young men and young women, since only a small proportion find it possible to enter a profession or a business career. This is forced upon a majority of our young people early in life and if proper choice can then be made it is a distinct advantage.

Since the principles underlying all arts are identical during the first two years a more or less definitely prescribed outline of instruction must be laid down. If at the end of this time peculiar adaptibility in any particular direction becomes evident to student, parent or teacher, specialization along this line will be possible. To illustrate more clearly, take the case of a young man who finds that his tastes and talents run along lines of machinery construction. During his third and fourth years he may devote twenty hours a week to machine shop practice. After completing the first two preliminary years in wood and iron working he may then devote a major part of his time to the particular branch along which his abilities lie and to which he may wish to devote his life work.

The department for girls will have domestic science and domestic and industrial art for its basis and around these studies the rest of their work will be grouped. Homemaking courses are of greatest value to girls and to train in this direction will be the aim of these departments. Cooking will be very practical and comprehensive, covering preparation and analysis of foods, the study of food values, and the preparation and serving of complete meals. This will be supplemented by courses in home planning and house decoration, taking up the study and arrangement of rooms; wall and floor coverings, study of furniture and pictures, draperies, etc. This will be organized with particular reference to economy and good taste. Segregated classes for the study of physiology and personal hygiene will give students an opportunity to acquire a

knowledge of those things which are so essential to their future health and happiness.

This instruction will be supplemented by a complete course in home nursing, including first aid to the injured, the care of invalids and particularly of children. Instruction in our high schools has never been specific enough along these lines but has been of a purely general nature. These courses are to be very practical and to the point, to the end that when a girl has forced upon her the care of the home and the family she will be thoroughly prepared for functions of this sort. Keeping of household accounts, economic home management, marketing, etc., will receive due consideration.

Similar opportunities for specialization during the last two years of the course will be offered girls as are provided for boys. In most cases the nature of the studies and method of teaching demand a separation of boys from girls. There will therefore be organized within this building a boys' school and a girls' school.

By eliminating entirely the long summer vacation a saving of an entire year in the high school course will be accomplished. This is most desirable from the standpoint of the student of limited means who wishes to secure a maximum of education in a minimum of time. It is therefore proposed to offer a three-year course as well as a four-year course. In any event the work covered will be identical. The school year will therefore be divided into four twelve-week periods with an intermission of one week between quarters.

Pupils who do not wish to take advantage of this shortened course or whose physical condition does not permit of the close application of continuous study will still have the opportunity of devoting four years to their high school course.

One of the most important missions which this school can fill is the betterment of people already engaged in a given vocation. The abolishment of the apprenticeship system in the subdivision of manufacturing processes has practically made it impossible for mechanics to secure any general training which enables them to better their condition. There is a crying need among semi-skilled working classes for an opportunity for industrial education and the technical high school will offer trade courses during the evening to men and women already engaged in a given trade.

The night classes will be divided into two sections, each reporting three nights a week from 7:00 until 9:30. One section will meet

Monday, Wednesday and Friday evenings, the other Tuesday, Thursday and Saturday evenings. In this way the night trade school could acommodate 1,400 men and 600 women.

A two years' course will warrant the issuing of a certificate and by requiring a high standard of work such a certificate should have distinct value. It should mean the placing in the hands of graduates of the evening schools a certificate of character, workmanship and industrial intelligence.

EDITORIAL

DURING the past summer there has been a large number of changes among the workers in the field of manual training and industrial education, as is seen by a glance at our "Current Items" department for this issue. Some of the changes, however, are so important as to deserve more than the usual notice. Among these are the retirement of Dr. H. H. Belfield with pension from the University of Chicago, the resignation of Professor Charles R. Richards of Teachers College to accept the directorship of Cooper Union, the appointment of Dr. Frank Rollins, head master of the Stuyvesant High School, as second assistant commissioner of education in New York State, and Arthur D. Dean's appointment as head of the new trade school division in New York State. That so large a proportion of these changes are in the interests of industrial education is proof of the vitality of the present industrial education movement.

Dr. Belfield's Retirement

Henry Holmes Belfield was born in Philadelphia in 1837. He was educated at Iowa College, receiving the degree of A. B. in 1858, A. M. in 1868, and Ph. D. in 1878. During the year 1858-9 he was tutor in Latin at his alma mater. The next three years he was principal and superintendent of public scools in Dubuque, Ia., and the following year he was tutor in Greek in Griswold College. Then came a sudden change: From June 1863 to August 1865 he was with the Eighth Iowa Cavalry as second lieutenant, then first lieutenant, and later as adjutant. Re-entering educational work he was principal of the Jones and Dore schools in Chicago from 1866 to 1876, and of the North Division High School from 1876 to 1883. He resigned the latter position to organize the Chicago Manual Training School, being elected director of this school June 25, 1883.

In July 1897 the school was given to the University of Chicago by the Chicago Commercial Club, its founders, and in the summer of 1903 the school was united with the South Side Academy, of which William B. Owen was principal, to form the University High School. During the twenty years of the independent existence of the school 900 boys were graduated.

Dr. Belfield, with Dr. C. M. Woodward of Washington University, Dr. James Macalister (at that time superintendent of schools in Milwaukee), Chas. H. Ham and Col. Augustus Jacobson of Chicago, was a pioneer in the manual training movement, and had many earnest and some unpleasant experiences in fighting the battle which placed manual training in the public schools. The Chicago Manual Training School was the first manual training school of high school grade not connected with a university, the only older school of this character being the St. Louis Manual Training School of Washington University.

As the Chicago Manual Training School, apart from the University of Chicago, has completed its work, it is possible, in a measure, to estimate its value. Being one of the first representatives of a new type of school, its equipment, courses and methods were studied by the thousands of visitors who came to its open doors. In this way it exerted a great influence in shaping the work in other schools. But if the Chicago School did one thing better than another we believe it was this: It always stood for the highest scholastic attainment in addition to thorough work in manual training. Dr. Belfield's long experience in high school work had given him familiarity with high standards in academic work and sure knowledge of the means of attaining them. These he maintained in the new school, as was proven over and over again when the young men went out from this school to the universities, often getting full credit for freshman year work and always receiving extra credit for chemistry and more or less credit for shopwork and drawing. It was this tenacious adherence to high standards of scholarship in Dr. Belfield's school that, at a critical time, turned enemies of manual training into enthusiastic friends.

One can better understand how this was accomplished by recalling a statement recently made by Dr. Belfield himself. He said, in reply to a question concerning the success of his school:

I determined upon the following ideas, with some others, as the basic ideas of the school.

1. Every boy should stand upon his own merits. The sons of the Commercial Club received exactly the same consideration, and no more, as the poorest boy in the school.

2. The moral tone should be as high as possible, and should dominate everything. Many boys were refused admission because of known or suspected immorality, and every boy detected in a violation of a strict moral code was quickly dismissed. Idleness was regarded as a crime.

3.. Pysical health was looked after with great care.

4. I determined that the scholarship of the school should equal that of the best high schools, notwithstanding the time given to drawing and shopwork.

5. No teacher should be employed who was not a Christian man. He must not use liquor or tobacco.

These principles were strictly adhered to.

Dr. Belfield has just celebrated the fiftieth anniversary of his graduation from college. He feels that he is still vigorous, with several years of active work in him, but he is seventy years old, and so comes under the pension regulation of the University of Chicago.

Professor Richards' Change

Although the decision of Professor Charles R. Richards to accept the attractive offer of the trustees of Cooper Union is but the logical result of his growing interest in the present problems of industrial education, the announcement that he was to leave Teachers College came as a great surprise and disappointment, not only to graduates of his department at the College, but to manual training teachers throughout the country, who look to Professor Richards for progressive leadership and sound pedagogy. He goes to Cooper Union because there he finds an exceptional opportunity to develop a great school for the working classes of New York City. The city authorities have turned over to the Union the old 69th Regiment Armory, just across Third Avenue and, with a new building on this site, the Union should expand into a real people's university.

In training, experience and point of view, Professor Richards is unquestionably qualified to carry forward this great work. Born in 1865, educated in the public schools of Boston and the Massachusetts Institute of Technology, he received the S. B. degree in 1885. The next two years he was assistant superintendent of the Whittier Machine Company. During the year 1887-8 he was a teacher of manual training at the Industrial Education Association, out of which grew Teachers College. From 1888 to 1898 he was professor of manual training and director of the department of science and technology at Pratt Institute. Since 1889 he has been professor of manual training at Teachers College, Columbia University. Before coming to the college he had made a study of European schools and in 1904 he traveled in India, China and Japan, gathering material, some of which he used in the series of articles on Oriental handicrafts published in the MANUAL TRAINING MAGAZINE soon after his return. With a knowledge of industrial schools in other countries and seeing clearly the need of more schools for vocational training in America, he started the movement that led to

the organization of the National Society for the Promotion of Industrial Education in November, 1906, and for two years was secretary of that society.

Mr. Richards is a member of the American Society of Mechanical Engineers and several educational associations; he is a trustee of the Children's Aid Society of New York and is a special investigator for the Department of Labor of the State of New York.

Notwithstanding his change to an administrative position, we are confident he cannot lose his special interest in manual training, with the development of which he has been closely identified during his entire professional life since 1887. In support of our conviction, we are glad to be able to state that he will still remain on the editorial staff of the Manual Training Magazine.

Dr. Rollins Goes to Albany At the June meeting of the Board of Regents of the State of New York, Dr. Frank Rollins, principal of the Stuyvesant (Manual Training) High School, New York City, was appointed second assistant to State Commissioner Andrew J. Draper, to succeed Dr. Edwin J. Goodwin, who has accepted the presidency of Packer Collegiate Institute of Brooklyn. This promotion, and transfer of Dr. Rollins' rare organizing ability to the State Department, is especially significant when it is understood that he will have much to do with the new division of trade schools. Dr. Rollins was born in Franklin County, Maine, in 1860. He was graduated with the degree of A. B. from Wesleyan Universtiy in 1889; pursued graduate work at Harvard University and afterwards at Columbia University, on account of which he was granted the degree of Ph. D. in 1902. After teaching at the Foxcroft Academy in Maine, and the Hanover grammar school in Meriden, Conn., he became assistant principal of the New Britain, Conn., high school; then, successively, first assistant in the Morris and DeWitt Clinton high schools in New York City; principal of the Stuyvesant high school, New York City, which position he has held for four years.

Arthur D. Dean's Appointment Another excellent appointment is that of Arthur D. Dean as chief of the division of trade schools in the New York State Education Department. This appointment is in pursuance to the law passed last winter authorizing the establishment of trade schools in cities and union free school districts, and giving the

Commissioner of Education general supervision of such schools. The appointment was made from the eligible list submitted to Dr. Draper by the State Civil Service Commission, Mr. Dean having attained the highest standing among all the candidates.

Mr. Dean is 36 years of age and was graduated from the Massachusetts Institute of Technology in 1895 with the degree of S. B. Since 1905 he has held the position as supervisor of industrial education in the Y. M. C. A. continuation schools in Massachusetts and Rhode Island, and for the past three summers he has been in charge of the department for the training of teachers for industrial education in the Cornell University summer school. Previous to his present position he was engaged in public school work in elementary and secondary schools, teaching at various times shopwork, mathematics and science. He organized manual training in the high and grammar schools of Malden, Mass., was head of the shopwork in the Springfield, Mass., Technical High School, and taught shop mathematics and elementary electrical engineering in the Evening School of Trades. This was the first public evening school of trades in this country, and has served as an example for many other cities.

While in Springfield he was granted a leave of absence to accept a commission from the insular government of Porto Rico to investigate industrial conditions, with the view of establishing industrial and agricultural schools. The report led to the establishment of five such schools.

For several years Mr. Dean has made a special study of the education of industrial workers and has written valuable articles on the subject, two of which have appeared in the *Massachusetts Labor Bulletin,* one in *Machinery,* and one in the Proceedings of the Society for the Promotion of Engineering Education. Readers of the *Craftsman* will recall that he wrote the prize-winning article on "Manual Training in Relation to Industrial Education and Efficiency," published last April.

The Trade School Law Mr. Dean's appointment brings to mind the law creating his position which was approved by Governor Hughes last May. This law provides that public school authorities in any city may establish and maintain as a part of the public school system *general industrial schools* open to pupils who have completed the elementary school course or who have attained the age of fourteen years, and *trade schools* open to pupils who have attained the age of sixteen

years and have completed either the elementary school course or a course in the general industrial school, or have met such other requirements as the local school authorities may have prescribed. The law further states it shall be the duty of any union free school district to maintain such schools whenever authorized by a district meeting. An advisory board of five members representing the local trades and industries is to counsel with and advise the school authorities.

To assist the school districts in maintaining schools the State will pay the sum of five hundred dollars for each independently organized general industrial or trade school maintained for forty weeks during the school year and employing one teacher whose work is devoted exclusively to such school and having an enrollment of at least twenty-five pupils. Two hundred and fifty dollars will be paid by the State toward the salary of each additional teacher similarly employed. But manual training high schools or other secondary schools maintaining manual training departments cannot receive an apportionment of such funds from the State. Moreover in order to secure such funds from the State a school must carry out a course of instruction approved by the Commissioner of Education. In fact, the Commissioner is to have general supervision over all such schools receiving state funds; he is to prescribe regulations governing the licensing of the teachers employed, provide for the inspection of the schools, and advise and assist boards of education. In other words, the State will in every reasonable way encourage the establishment of a system of industrial and trade education and give expert advice and supervision through the new division of trade schools, of which Mr. Dean is the head.

Industrial Schools Independent of Manual Training

It is noticeable in the law above referred to that a sharp line has been drawn between manual training on the one hand and general industrial and trade schools on the other. The reason becomes clear when one reads Dr. Draper's Cleveland address, just published in pamphlet form. He says:

These new schools ought to be sharply distinguished from any schools that are now known in America. They ought to be wholly apart from the manual training schools. They will have a distinct individuality and a definite object of their own. They are neither, primarily, to quicken mentality nor to develop culture; those things will come in the regular order. The "culturists" are not to appropriate these new schools. They are not to train mechanical and electrical engineers; the literary and technical schools are doing that very amply. They are not even to develop foremen; leaders will develop themselves for they will

forge ahead of their fellows by reason of their own ability, assiduity and force. The new schools are to contain nothing which naturally leads away from the shop. They are to train workmen to do better work that they may earn more bread and butter.

So far as we have learned no course of study for one of these industrial schools has been published. We shall await its coming with much interest. Concerning these schools Dr. Draper has said:

> A tentative plan would make these new schools more shoppish than schoolish, put them in plain but large buildings, sometimes using idle factories of which many cities have a supply; use books somewhat but make reading subordinate to manual work; * * * put them in charge of craftsmen who can teach, rather than teachers who are primitive mechanics; keep them open day and evening; make the instruction largely individual; adjust them to the needs of those who must work a part of the time at least in order to earn a living; and make them for boys and girls and men and women, and of every kind and description which may be necessary to meet the demands of the local factories and trades.

It is perfectly clear that the trade school must be an independent school or it will not be a success, but it is not so clear that the general industrial school must be. Why cannot the general industrial training be provided in the high school manual training department or in a brief preliminary course in the trade school itself? Wherever manual training is given proper emphasis and is taught by thoroughly competent teachers we believe there is no great demand for a general industrial school nor will there be, provided (1) that the time given to the subject be properly increased; (2) that the manual training teachers keep awake to changing local conditions, and (3) that the principals and superintendents and teachers of other subjects co-operate with the manual training teachers in giving every boy the training he most needs.

If the present manual training is not sufficiently industrial in character it can be made more so. Why duplicate equipments and multiply expenses? We believe the manual training teachers are anxious to do their part and only wait a reasonably liberal time allowance to make their work more effective from every standpoint. We realize the complexity of the problem, but we suggest that there is more than one solution possible. —C. A. B.

"That we do not have trade schools is not because we cannot afford them. The time is coming when we will find that we are too poor not to have them. Anything which makes a workman take pride in his handiwork makes for conservatism."—Dean Russell, Teachers College.

In accordance with our announcement in the April number we reproduce below the best wash drawing submitted in "Manual Training Magazine Competition No. 5." The prizes were awarded as follows:

First prize—L. Clyde Ripley, Sault Ste. Marie, Mich.

Second prize—Antonio Cirino, Providence, Rhode Island.

Third prize—Paul Schumm, Ethical Culture School, New York City.

The tailpiece on page 27 was made by a student of Forrest Emerson Mann, and the one on page 58 by H. L. Diets, a summer school student in constructive design at Bradley Polytechnic Institute.

ASSOCIATIONS

WILLIAM T. BAWDEN, Editor.

EASTERN MANUAL TRAINING ASSOCIATION.

The Annual Meeting of the Eastern Manual Training Association was held in Washington, D. C., April 13th. to 15th. The general sessions of the convention were held in the Business High School and the business meeting and reception at the McKinley Manual Training High School. The Convention opened on Monday evening, April 13th. with an address of welcome by the Hon. H. B. F. MacFarland, Commissioner of District of Columbia, the annual address of the president, John C. Brodhead, who spoke briefly on the ideals of the Association, and an address by the Hon. James Wilson, Secretary of Agriculture. Mr. Wilson made a strong plea for school instruction in agriculture. He said that "the time is fast coming when the common people won't be able to eat meat at all and poor people can not even have pie plant. Why is this? Because we have not instructed our boys in scientific methods of agriculture by which they could make a success of the farm. As a result, they are leaving the farm for the factory and the railway shop, where they can make more money; and agriculture, the most important occupation in the world is being neglected."

Tuesday afternoon was given up to Round Table discussions and excellent papers were read and discussed as follows:—Manual Training For Boys. Joseph C. Park, Chairman. State Normal and Training School, Oswego, N. Y. Topic: "Fundamental Principles of Manual Training." Joseph C. Park, Oswego, N. Y. Discussion: J. A. Chamberlin, Supervisor of Manual Training, Washington, D. C. Topic: "The Content of the Course of Study for the Grades and High Schools." William J. DeCater, Howard Uuiversity, Washington, D. C. General discussion. Topic: "Correlation based on Social and Individual Needs." George E. Myers, Principal, McKinley Manual Training School, Washington, D. C. Discussion: R. Charles Bates, The Jacob Tome Institute, Port Deposit, Maryland. Topic: "Modeling made Practicable for Large Classes." Mary G. Davis, Public Schools, Boston, Mass.

Domestic Science and Arts: Miss Irene E. McDermott, Chairman, Director Domestic Science and Arts, Allegany High School, Allegany, N. Y. Topic: "The Social Value of Domestic Science Training". Mrs. Ada B. Williams, Supervisor Domestic Science, Cleveland Public Schools. Topic: "Methods—Individual, Group, Demonstrations."

Manual Arts In Normal Schools. Alvin E. Dodd, Chairman, Director of Normal Training, Trenton, N. J. Topic: "What the Normal School may do for Industrial Education," William C. A. Hammel, Director of Manual Arts, State Normal and Industrial Schools, Greensboro, N. C. Discussion. Topic: "Hand Work in Normal Schools." A. E. Dodd, Trenton, N. J. Discussion.

On Tuesday Evening adresses were given by James H. Dix, of the Philadelphia Vacant Lots Cultivation Association on "The Great Manual Training of Forty Millions of our People" and by Frank O. Carpenter, Master of the Depart-

ment of Commerce, English High School, Boston, Mass. on "What shall we teach our pupils about the Materials they use?" Mr. Carpenter gave a most entertaining description of the methods employed by him in arousing the interest of pupils to discover useful facts about various materials.

On Wednesday morning four excellent addresses were given:

Hon. T. D. Sensor, Chief of the Bureau of Examination, Department of Public Instruction, Trenton, N. J., on "Industrial Education as applied to the Rural Schools;" J. H. Morse, Principal of the Primary Industrial School, Columbus, Ga., on "The Time and Place for Industrial Education;" Charles R. Richards, on "The Chicago Convention and the Possibilities of Manual Training," and M. W. Alexander, of the General Electric Company of Lynn, Mass., on the subject, "How can the Public Schools prepare a Boy for an Industrial Career?"

Mr. Alexander said that the public schools, while they succeeded in teaching facts, failed to instruct the pupil how to apply the facts which he had learned to a problem with which he was confronted. He also outlined a plan for elective industrial classes, to be open to all pupils over 12 years of age, to be held after regular school hours and on Saturday forenoons. He also referred to the work along these lines which is being done in the school carried on by the General Electric Company.

On Wednesday afternoon the delegates visited the Armstrong Manual Training High School, where a very interesting and creditable exhibit had been arranged showing the work of the school and also the work done in rural schools by teachers who had graduated from the Armstrong School.

A most enjoyable song festival of negro melodies was given by the Glee Clubs of this school and a short address was given by Dr. Wilson Bruce Evans, Principal of the school.

President Roosevelt received the members of the Association at 2:30 at the White House.

The convention closed with a business meeting and a reception given by the teachers of the McKinley Manual Training High School.

The place of meeting for 1909 was referred to the Executive Committee. The Meeting will probably be held at or near Boston. The Association also expressed itself as favoring a joint Meeting of the Eastern and Western Associations to be held in Rochester, New York, in 1910.

The officers elected for the coming year were:—President, Frank M. Leavitt, Assistant Director of Drawing and Manual Training, Boston; Vice President, Alvin E. Dodd, Director of Manual Training,Trenton, N. J. ; Secretary, Miss Irene E. McDermott, Alleghany, Pa.; Treasurer, Thellwell R. Coggeshall, Girard College, Philadelphia, Pa.; Secretary of Transportation, Alfred P. Fletcher, Director of Manual Training, Rochester, N. Y.; Editor, Miss Evelyn L. Winslow, Springfield, Mass.; Additional members of Executive Committee, A. D. Alexander, Pittsburgh, Pa., J. A. Chamberlain, Washington, D. C., A. J. Morse, Columbus, Ga.

EASTERN ART TEACHERS' ASSOCIATION.

The tenth annual meeting of the Eastern Art Teachers' Association was held at the American Museum of Natural History, New York City, May 14-16, 1908.

Following are some of the addresses scheduled on the program: "The Teaching of Art," by Dr. Denman W. Ross, Harvard University; "The Creative Spirit in Teaching," by Dr. Hamilton Wright Mabie; "Pencil Sketching from Nature," by Dr. James P. Haney, New York; "The Educational Work of the American Museum of Natural History," by Dr. H. C. Bumpus, Director; "The Opportunity of the Art Teacher," by Miss Susan Blow; "Experiments in Connecting Boston Schools with the Museum of Fine Arts and with Fenway Court," by Miss Alicia M. Keyes, Boston; "The Use of Historic Ornament in Teaching Art," by Walter S. Perry, Pratt Institute; "Should Art in the High School be for the Talented Few?," by Miss Mabel B. Soper, West Newton, Mass.; "Drawing in Intermediate Grades," by Walter Sargent, Boston.

NATIONAL EDUCATION ASSOCIATION.

The forty-sixth annual meeting of the National Education Association was held at Cleveland, Ohio, June 29 to July 3, 1908. More attention than ever before was given to the subjects of manual training, industrial education, and rural and agricultural education, as may be observed from the following list of titles of addresses: General Sessions: "Compulsory Education in Industries in London Schools," by C. S. H. Brereton, divisional inspector, London, England; "Adaptation of the Public Schools to Industrial Ends," Andrew S. Draper, New York; Department Programs: "Report of Committee on Industrial Education for Rural Schools," L. D. Harvey, Menomonie, Wis.; "Industrial Arts in Normal Schools," by H. H. Seerley, Cedar Falls, Iowa; "The Bearings of Art on Industry," by Charles Zueblin, University of Chicago; "Good Citizenship and Industrial Training," by Andrew S. Draper, New York; What is Agriculture—Elementary—Secondary—Collegiate?," by A. C. True, Department of Agriculture, Washington, D. C.; "Successful Work in Agriculture in Rural Schools," by B. M. Davis, Miami University, Oxford, O.; "Work of the Normal School in preparing Teachers to Teach Agriculture," by H. G. Williams, State Normal College, Athens, O.; "National Aid in Agricultural Education," by Hon. E. E. Brown, U. S. Commissioner of Education.

The general topic of the Department of Manual Training was "The Place of Industries in Education," treated in three divisions: A. Democracy in Education: "The ideals of democracy require that equality of opportunity in education be offered to all," by W. E. Chancellor, University of Chicago; "Equality of opportunity can be secured only by a systematic recognition of individual differences in native capacity and in prospective career; The requirements of these individual differences constitute the rational basis for secondary as distinguished from elementary education," by David S. Snedden, Teachers College, New York. B. Industries as a Factor in Education; "Industrial education has exerted a pre—eminent influence in social progress," by S. C. Parker, Miami University, Oxford, O.; "The industrial aspect of social life affords a varied and significant body of subject matter which is an essential element in a system of education controlled by social standards," by Supt. C. B. Gibson, Columbus, Ga.; "The important function of constructive activities in education is to reveal the social significance of industrial activities." C. A program of Industrial

Education: "The most urgent educational need of to-day is provision for industrial training in public schools," by Charles H. Morse, Boston; "Constructive activities as an essential part of elmentary education," by M. W. Murray, Springfield, Mass.; "Intermediate industrial schools, admitting children at the sixth school year and equipping them for entrance into industrial pursuits," by E. S. Barney, Hebrew Technical Institute, New York.

The report of the "Committee on Collecting Data for Courses in Manual Training in Public Schools," was presented by Mr. Keyes. It recommended that the committee be increased to a number not less than fifteen nor more than twenty and that it be given another year to work. It was a report of progress and presented an outline of work for the coming year. The Department voted to increase the size of the committee and to continue it for a year This was the only committee to secure the financial help of the Board of Directors for the coming year.

The Department of Manual Training elected officers, as follows: president, James E. Addicott, Isadore Newman Manual Training School, New Orleans, La.; vice-president, Miss Laura E. Day, Department of Home Economics, University of Missouri; secretary, A. E. Dodd, North Bennett Industrial School, Boston, Mass.

At the Manual Training conference of the Southeastern Iowa Teachers Association on April 3rd the organization of a state association of Manual Training teachers was discussed. It was the unanimous opinion of those present that there should be such an organization in Iowa in order to give those who are teaching Manual Training an opportunity to become acquainted and exchange ideas and experiences.

A committee consisting of L. P. Elliot, Iowa City, chairman; R. C. Kelley, Ottumwa; and E. C. Graham, Davenport, was appointed to correspond with the other teachers of the state and ascertain whether or not it would be feasible to organize.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION.

The sixteenth annual meeting of the Society for the Promotion of Engineering Education was held at Detroit, Michigan, on the twenty-fourth to the twenty-seventh of June. The program covered a wide range of topics, many of which were as interesting to teachers of manual training and technical schools of secondary grade as to instructor and organizers of collegiate courses in engineering subjects.

President Charles S. Howe of Cleveland, in his address on "The function of the Engineer in the Conservation of Natural Resources of the Country," gave a summary of the proceedings of the National Convention that met in Washington recently to discuss the conservation of natural resourcs. He showed that the gas engine with gas producer plant, on account of higher efficiency, must replace the steam engine; that water power must come into more general use; concrete must replace timber. He spoke of the necessity of educating men to meet these problems, and in closing said: "The most difficult thing in teaching engineering is to teach students to *think.*"

Prof. J. P. Jackson in his address, "Scholasticisms in Engineering Educa-

tion," made a protest against "cultivating the mind without reference to utility," just because it is customary.

He made a plea for educating the boys who do not ordinarily finish the grammar grades. He remarked that a boy should get a tool somewhere. The great men of the future in education, will be those who meet these problems of the lower grades, and not the university professors." He suggested that instructors be obtained from the industries and that a greater effort be made to interest employers in engineering education.

The most interesting paper was that read by Prof. Herman Schneider, "Two Years of the Co-operative Engineering Courses, University of Cincinnati." The students in this course work in Cincinnati shops on alternate weeks. The course covers six years. At the beginning students are paid 10c. per hour, and are increased 1c. every six months. There has been the heartiest co-operation on the part of the employers. The students taking this course rank much higher in every way than the regulars. Descriptive geometry and machine design are taught as one subject. An effort is made to bring theory and practice as close together as possible.

This paper called forth a great deal of discussion. It was suggested that the reason of the high standing of students of this course was because they were so carefully picked from the best.

A committee was appointed to meet with a committee from the Society for the Promotion of Industrial Education to discuss whether or not it is advisable for the two societies to co-operate. FREDERICK H. EVANS.

NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION.

The National Society for the Promotion of Industrial Education announces that its next annual meeting will be held at Atlanta, Ga., November 19, 20, and 21. The first day will be devoted to the meetings of state branches and state committees and to the annual meeting of the Georgia branch.

A banquet will take place on the evening of the 19th, at which the president of the Georgia state branch, Asa G. Chandler, who is president of the Atlanta Chamber of Commerce, will preside. Industrial education as it relates to the prosperity of the country will be discussed at the banquet by eminent men representing the educational and industrial interests of the people of the United States. Governor Hoke Smith has already accepted an invitation to extend the welcome of the State and to point out how an effective system of industrial education will result in lasting prosperity to the country and, therefore, in benefit to the industrial workers. The other banquet speakers are to be Dr. Elmer E. Brown, United States Commissioner of Education; Hon. James Wilson, Secretary of the Department of Agriculture; Andrew Carnegie, and the president of the National Society for the Promotion of Education, Dr. Carroll D. Wright, former United States Commissioner of Labor and now President of Clark College.

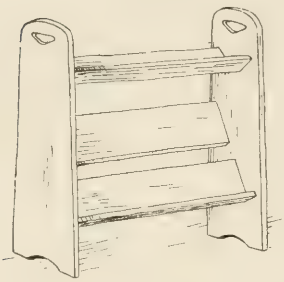
An exhibition of trade school work from all over the United States will be one of the features of the convention. This exhibition is being prepared under the direction of Prof. K. G. Mathewson, president of the Georgia School of Technology, Atlanta.

SHOP PROBLEMS

GEORGE A. SEATON, Editor.

BOOK AND MAGAZINE RACK.

The pleasant room furnished with the work of the manual training students of Cleveland will be remembered by all who visited the Board of Education headquarters during the meeting of the National Education Association. Among the other attractive models was the little rack laden with magazines of interest and displaying a row of books with titles familiar to all teachers of manual training. The placing of the magazine shelf and also the trough for the books made possible the reading of the titles without stooping to examine the books, while the handholes at the top not only allowed the rack to be carried from place to place but also served as just the right touch of ornamentation to relieve the plainness of the sides.



TIE RACK.

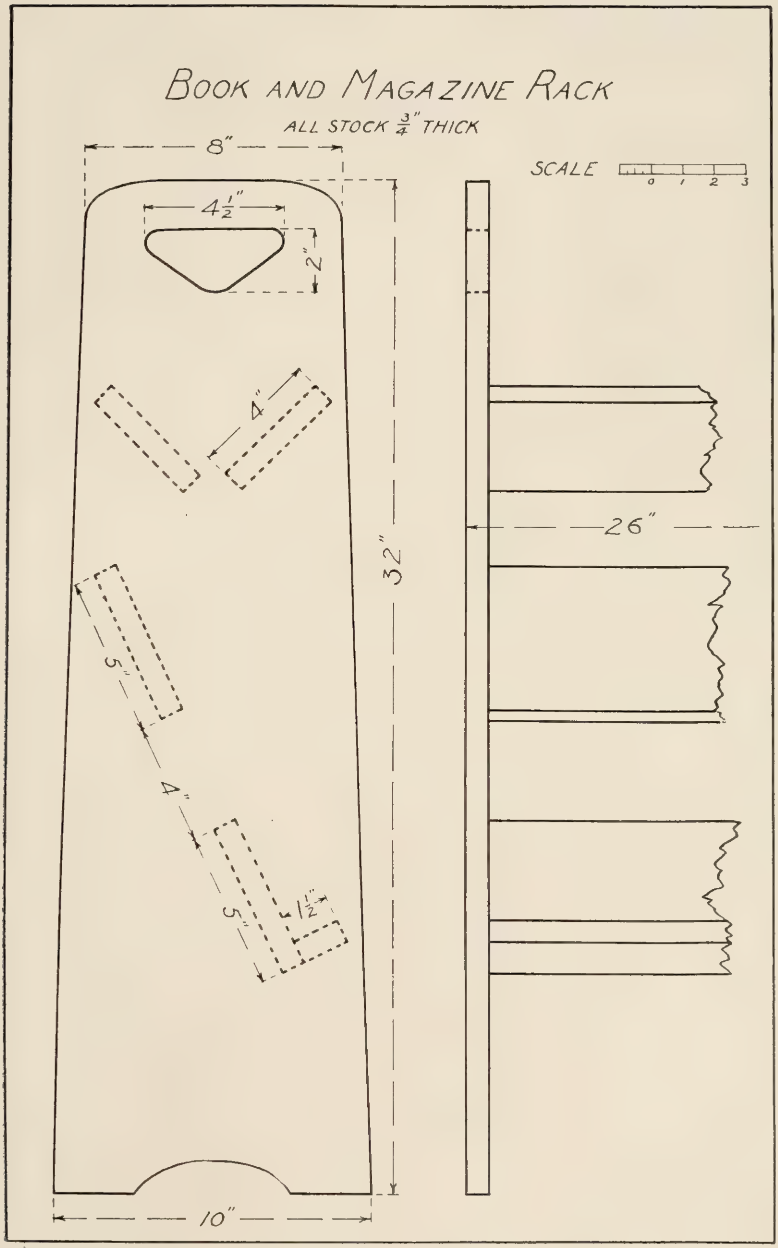
It is always difficult to find a problem which is simple enough for the student taking his first steps in woodworking yet which has sufficient beauty to make it worth while. W. E. Roberts of Cleveland provides an attractive model and one which is capable of infinite change by pleasing modifications of the outlines of the ends of the back. It will be surprising what variety may be obtained in this one model from a class.

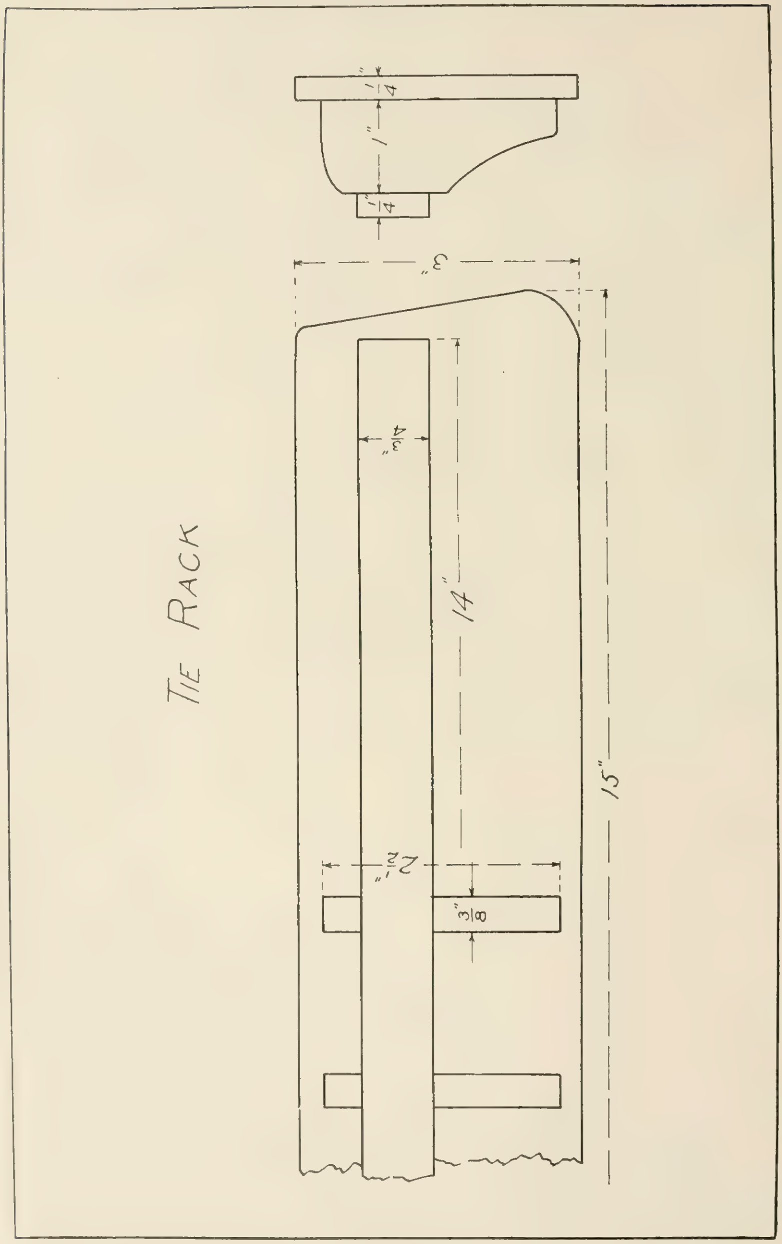
HOCKEY STICK AND SHIN GUARDS.

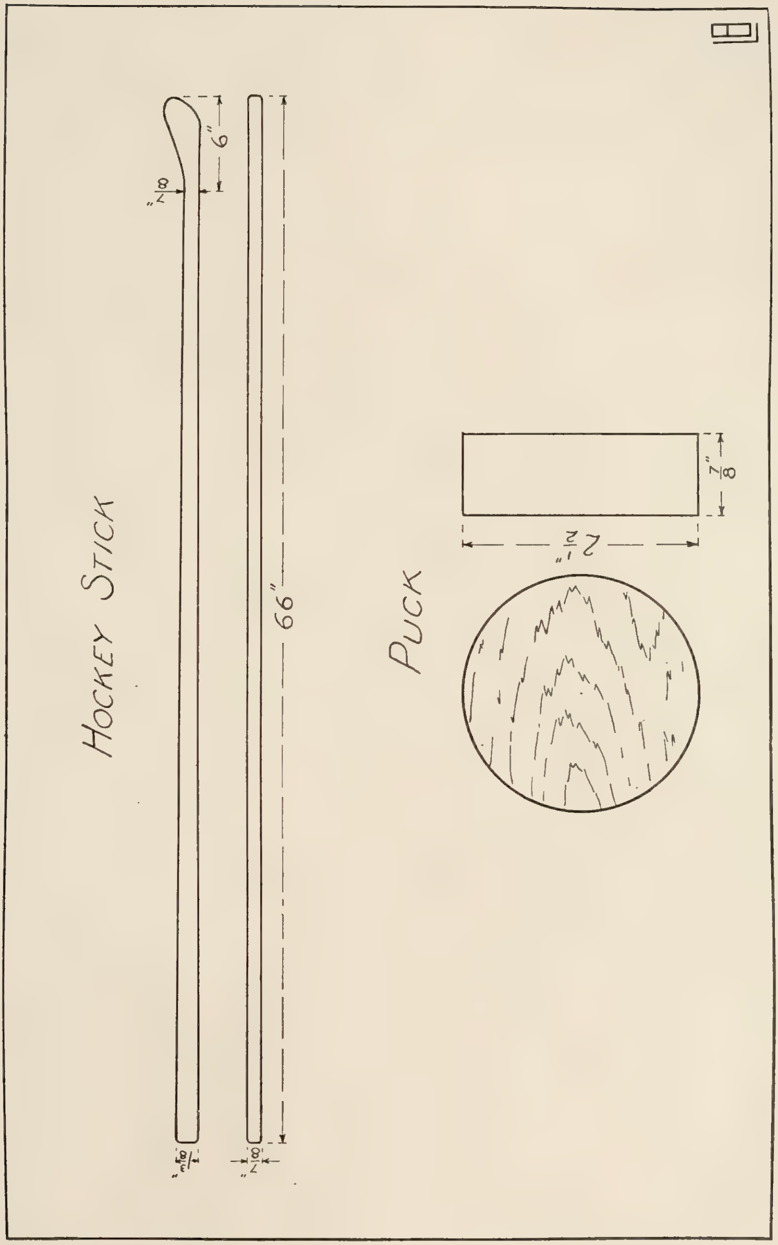
During the past couple of years the city administration of Cleveland has built some fifty skating ponds on vacant lots and greatly improved the park lakes. This has given a great boom to ice hockey and has made timely the models which are sent by Mr. Lynn W. Beman.

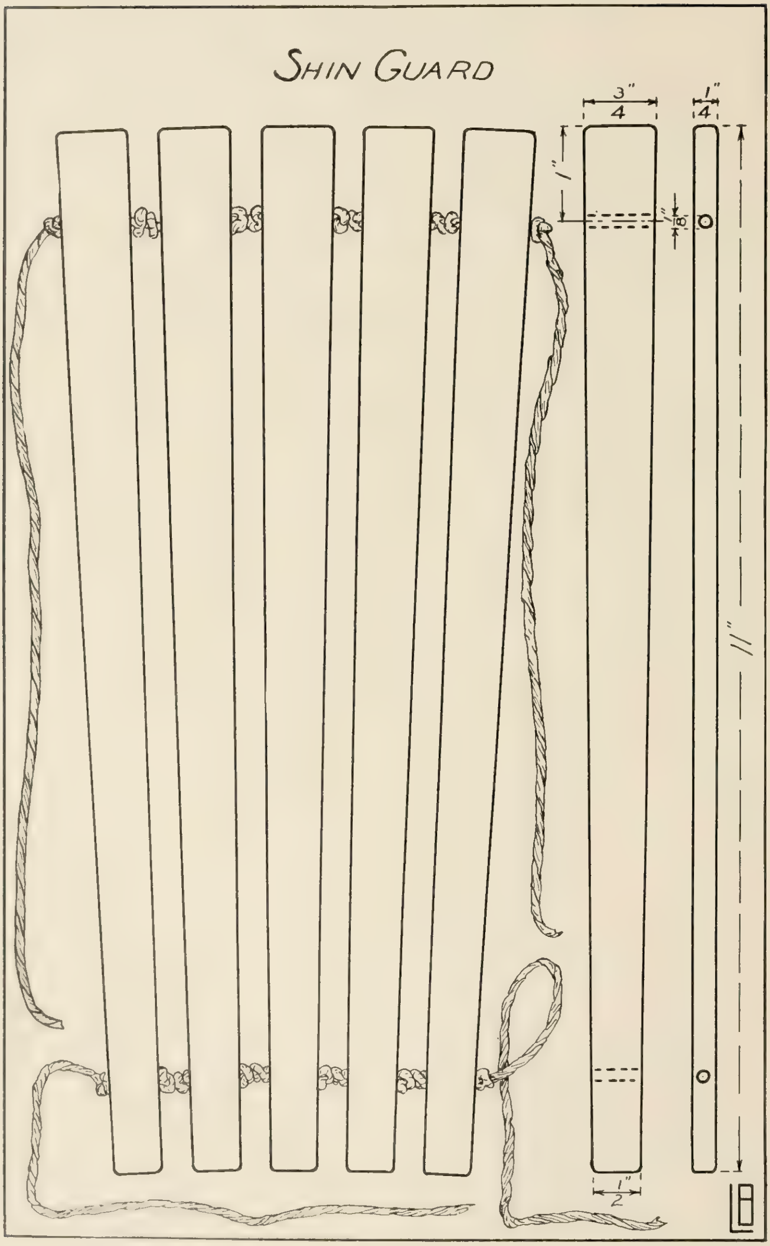
The length of the hockey stick may vary with the needs of the boy while the width of the blade will depend upon the strength of the wood which is used. The puck may be made of any soft wood and will be found an excellent exercise in accuracy.

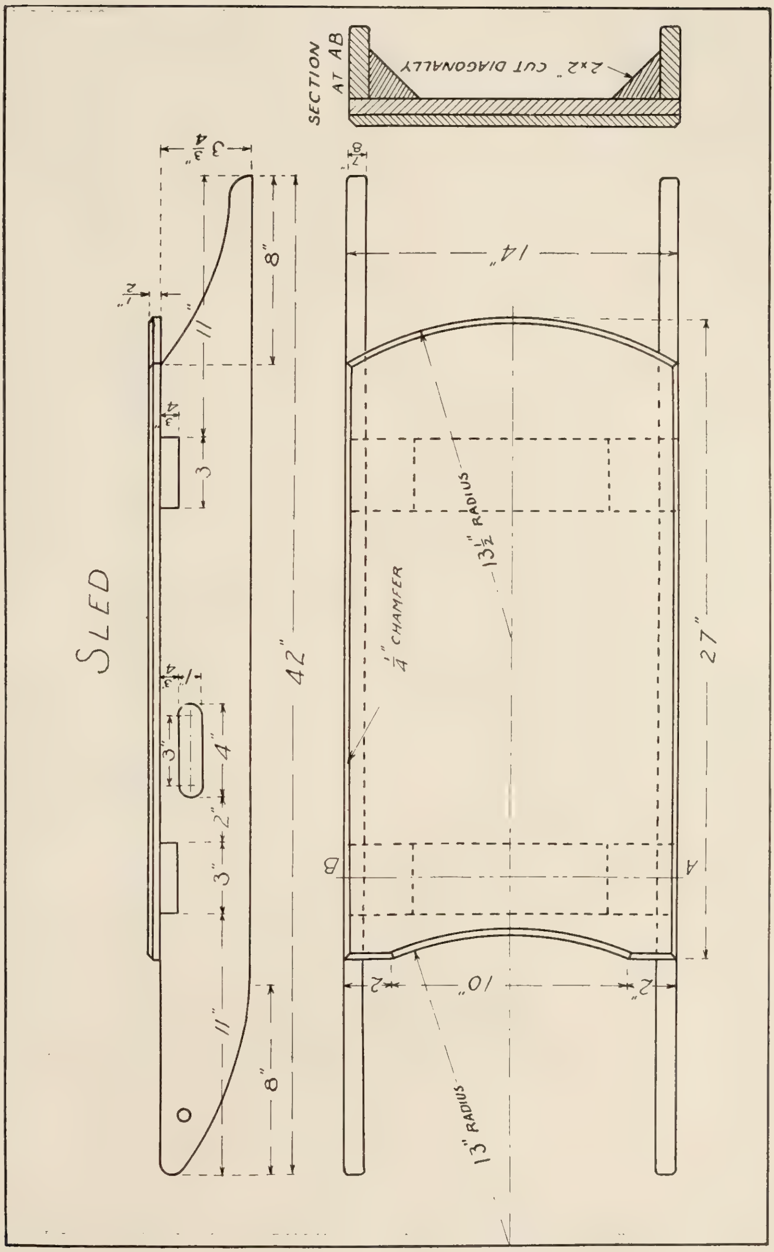
The shin guards will have to be made to fit the individual. They should be long enough to overlap the shoes about an inch and reach as high as they can without binding at the knees. The holes should be made with an eighth-inch drill and slightly countersunk. Any twine about an eighth of an inch in diameter will serve to fasten the strips together. In a somewhat similar way ten or twelve slats of the right length may be joined together to form a chest protector for a baseball catcher.

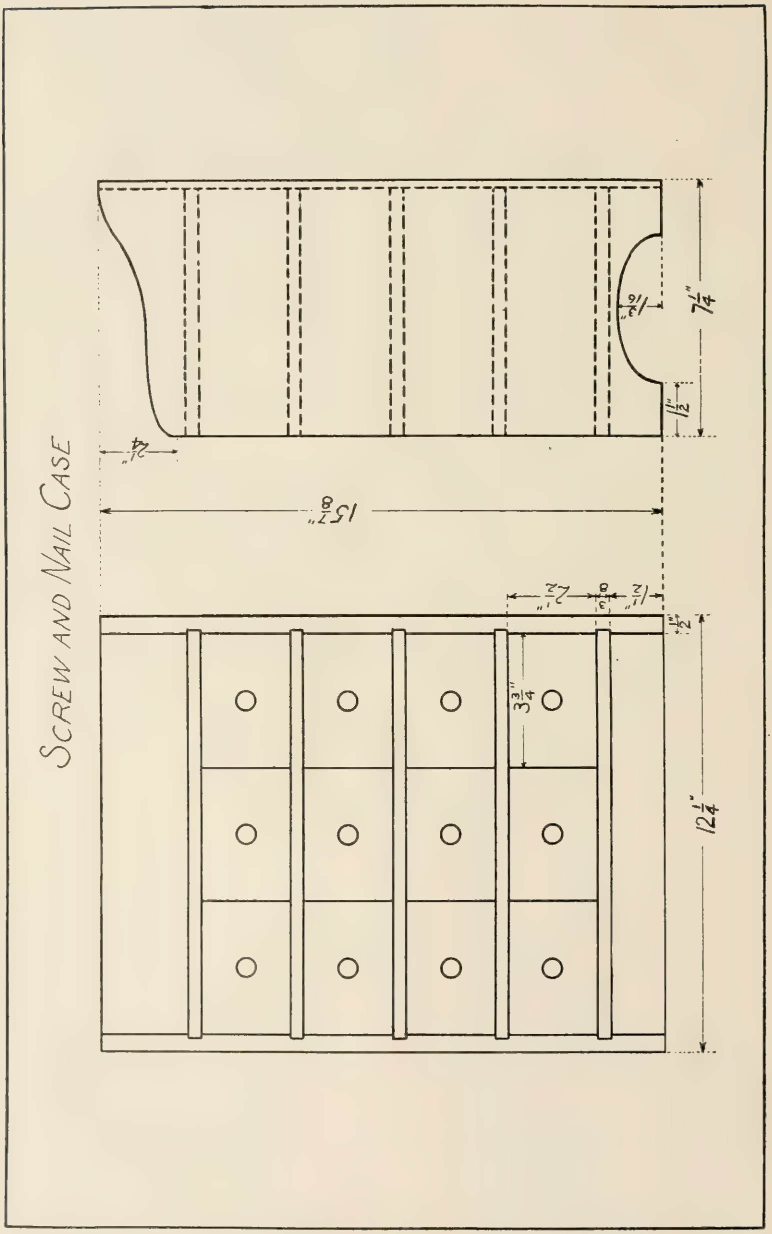

BOOK AND MAGAZINE RACK
ALL STOCK 3/4" THICK
8"
4 1/2"
2"
4"
32"
5"
4"
5"
1 1/2"
10"
SCALE
0 1 2 3
26"


TIE RACK
3"
14"
15"
1"
1/4"
1/4"
3/4"
2 1/2"
3/8"


HOCKEY STICK
6"
7/8"
66"
PUCK
7/8"
2 1/2"


SHIN GUARD
3"/4
1"/4
1"
1"/8
11"
1"/2


SLED
SECTION AT AB
2×2" CUT DIAGONALLY
1/4" CHAMFER
13 1/2" RADIUS
13" RADIUS
42"
27"
14"
10"
11"
8"
4"
3"
2"
B
A


SCREW AND NAIL CASE
7¼"
1½"
15⅞"
12¼"
3¾"

Screw and Nail Case.

While students will always be interested in producing something which will satisfy their own needs, they frequently take an equal pleasure in making something which they feel will be of use to the school. The screw and nail case of which L. B. Crandall of Plainfield, N. J., has sent the photograph and drawing, is a piece of shop furniture simple of construction but extremely practical. It can be constructed by one student, or each member of the class may take one drawer, while the framework and assembling may form another task.

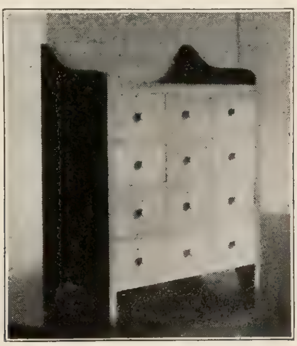
Sled.

For boys in the seventh or eighth grade in that portion of the country in which snow abounds, the construction of a sled is a source of never failing interest. The drawing given is that of P. S. Hasty of the Isadore Newman Manual Training School of New Orleans.

Poplar ¾ in. to ⅞ in. thick has proven satisfactory for the sides and cross pieces, and ½ in. chestnut for the top. The pupils must be cautioned in making the sides or many will forget and cut the curve at the back upon the same edge as the one at the front; or will cut the mortises for the cross pieces on the bottom edge. The curves can be marked by the use of a small dowel rod or other limber stick bent through the required points. After one side has been completed the other should be marked from it to insure their being exactly alike. If desired, two hand holes may be made instead of one.

The runners should be made from ¾ in. strap iron, which may be obtained from almost any hardware dealer. These strips should be about 48 in. long and should have the corners rounded at each end to prevent the clothing being caught and torn. The runners are fastened an with threepenny common wire nails, beginning at one end and working along toward the other, keeping the runner always tight and placing nails from 4 in. to 6 in. apart.

Eight penny nails are best for securing the cross pieces to the sides but an eighth inch gimlet hole should first be bored for each nail, as they come so close to the end that otherwise the cross piece will split. For fastening the corner braces use three or four penny nails and 1¼ in., No. 16 wire brads for the top.



CURRENT ITEMS

CLINTON S. VAN DEUSEN, Editor.

An experiment in co-operative industrial education is being tried in the high schools of Fitchburg, Mass., that is certainly novel in many respects and will be watched with interest by those trying to solve some of the problems in industrial education. Seven metal working factories of the city, including engine, saw and tool works, are co-operating with the school authorities in carrying out the plan. Boys just entering the high school and electing this course will take the full time in school, while boys who have been in school one year, or older boys, if fitted, may begin on half time in the shops. The course as tentatively planned by Wm. B. Hunter, who came from Boston to direct the work, is as follows:

First year, all school work—English, 4 periods; geometry and algebra, 5; mechanics, 5; mechanical drawing, 5; current events, 2; total, 24.

Second year, school and shop work—English, chemistry, electricity, 4 each; review algebra and geometry, 5; mechanical drawing, 8; total, 25.

Third year, school and shop work—English, solid geometry, business methods and conditions, and office practice, 4 each; mechanical drawing, 8; advanced chemistry, 5; total, 25.

Fourth year, school and shop work—Civics and economics, 5; trigonometry, descriptive geometry and applied mathematics, 10; drawing, 8; total, 23.

The boys will go to school and shop on alternate weeks, will be apprenticed and paid wages, covering all their time.

The Ludlow Textile School is just entering on its second year, and as it was established to solve a definite industrial problem some of its features will be of interest to manual training teachers. This school is in charge of J. J. Eaton and is carried on in connection with the hemp mills of Ludlow, Mass. Boys fourteen years of age are admitted to the school and devote half of each day to work in the mill and the other half of the day to school work, receiving pay from the mills. Most of the subjects taught in the public schools are taught in this school, including arithmetic, geography, history, manual training, etc. The main difference between the methods of this school and the public schools is that each subject is specialized. For instance, in history, when the pupils come to a great inventor, such as Eli Whitney, they study his life, get a good idea of the working and use of his more important inventions, learn what effect the inventions have had on the industrial advancement of the world, and so on. In geography, when they come to a country where hemp, the principal fiber used in making the twine and sacking made by the Ludlow Associates, is grown, they make a special study of the country, learning of its climate, its geographical position with respect to the lines of commerce, the race, creed and character of its inhabitants, labor conditions, and so forth. In the course in English, fairly correct speech and an ability to read understandingly have been sought after, rather than any comprehensive knowledge of the principles of grammar. In arithmetic a novel depart-

ure was begun last year. Principal Eaton had not been in charge of the institution very long before he saw that a special arithmetic with its definitions in mill terms and with its problems in mill subjects, would aid greatly in carrying out the purpose for which the school was founded. As there was no such textbook he had to get along as best he could, but with the help of Richard Brady, one of the mill superintendents, he has compiled an arithmetic along the lines desired and will use it in the course this year.

A course in what might be called practical botany was given last spring when a plot in the rear of the school was planted with hemp. As the seeds came up well and the plants flourished, most of them attaining a height of more than six feet, the pupils were able to get a practical idea of what hemp is; what it looks like; how it grows; the nature and appearance of the raw fibers; through what parts of the plant they run; how they are extracted, and many other useful bits of knowledge. This experimental plot is also of general interest to the public, because it is the only hemp grown in the locality. The manual training work for the first year consisted of ordinary bench work but lathe work is to be started this year and it is probable that this department will develop further as the age of the school increases.

The management of the Secondary Industrial School of Columbus, Ohio, was evidently successful in supplying something original for their closing exercises. Practical demonstrations were given of the work of the school. Several young ladies demonstrated on the platform the measuring for and making of a pattern for a dress. They then retired to the sewing room and made the dress, from cloth that had been woven in the textile department while the exercises were in progress. A young lady appeared before the close of the exercises wearing the completed dress. Similar practical demonstrations were given in typewriting, cookery and machine shop work.

Superintendent Maxwell of New York City has called attention to the possibility of offering vocational training to the so-called "over-age" pupils, who are found in considerable numbers in the lower grades of the grammar schools. These boys are mentally slower than their mates and are at the present time left to work their way as best they may through the grades, or are segregated in special classes and coached in number and language work. For these pupils vocational work of the kind suggested for the elementary school would offer manifest advantages.

Fred D. Crawshaw, principal of the Franklin School, Peoria, Illinois, has been appointed assistant dean in the Department of Engineering of the University of Illinois. He will work directly under Dean W. F. M. Goss, coming in close personal contact with all the students of the department. Men who have been in Mr. Crawshaw's classes will be glad to know that this change does not mean that he will give up teaching or lose his interest in manual training. On the contrary, it is expected that he will find time to teach a few classes and that he will be an important factor in the further development of industrial education at the University.

Leonard W. Walstrom has left the Ethical Culture School, New York City, to take charge of the work in manual training at the Francis W. Parker School in Chicago. We welcome him back to the Middle West.

Dr. W. N. Hailman has given up his work at the Chicago Normal School to become superintendent of the Interlaken School at La Porte, Ind. This new school modeled after Dr. Cecil Reddie's famous school in England is adding a manual training building this year.

Michael W. Murray has resigned his position as supervisor of manual training in Springfield, Mass., to take a similar position in Newton, Mass. After this year, in addition to his supervisory work in the grammar grades, he will be associated with Charles A. Kirschner of the Boardman School of New Haven, who is to be the head master of the new high school in Newton.

Fred H. Daniels, supervisor of drawing in Springfield, also goes to Newton to direct the work in drawing. Edward Newell of the Salem Normal School will take Mr. Daniel's place in Springfield.

Dr. James P. Haney, director of art and manual training in New York City, has spent a busy summer. Immediately after his summer school work at the New York University, July 1st to 21st, he sailed for England as a delegate of the National Society for the Promotion of Industrial Education to the International Art Congress. From there he went to Germany to investigate industrial schools.

Egbert E. MacNary has resigned his position in the Horace Mann School, Teachers College, and has accepted the position of principal of the Manual Training School, Hoboken, New Jersey.

Julian A. Burruss has resigned his position as director of manual arts at Richmond, Virginia, having been elected director of the new State Normal School, Harrisonburg, Virginia. His position in Richmond will be taken by Fred B. Hagaman, who comes from Mt. Vernon, Ohio.

Charles L. Jacobs has resigned his position at the B'nai B'rith Manual Training School, Philadelphia, and has accepted the position as director of manual training in the schools of San Jose, Cal.

Charles F. Smith, of Cleveland, Ohio, who has been spending the past year at Teachers' College, is to have charge of the gymnastics and the manual training work at the Staten Island Academy, New Brighton, New York.

Robert W. Selvidge has been elected professor of manual training at the University of Missouri, Columbia, Missouri. Mr. Selvidge is a graduate of the Manual Training Teachers' Course at Bradley Polytechnic Institute and has spent the past year in advanced study at Teachers College.

The new building for the David Ranken, Jr., School of Mechanical Trades being erected in St. Louis will be completed in February and will be one of the most thoroughly equipped structures of its kind in the United States. The building will contain a central assembly room which will accommodate 300 pupils, five trades rooms and four class rooms. The director of this school will be Louis Gustafson, formerly of Lewis Institute, Chicago.

The town of Sterling, Illinois, has received $8,000 from the estate of Dr. L. S. Pennington, the income of which will be used to maintain manual training.

Theodore H. Pond has left the Mechanics' Institute at Rochester, New York, to go to the Maryland Institute at Baltimore, Maryland, where he will have charge of the department of design and the applied arts.

BOOK PLATES DESIGNED AT NEW YORK UNIVERSITY BY STUDENTS
UNDER DR. JAMES P. HANEY.

During the past year Principal James F. Barker of the new Technical High School in Cleveland has been selecting his corps of assistants. It is clear that his aim has been to secure strong teachers who have had practical experience in some field outside of teaching. His first assistant is Frank E. Mathewson, who comes from the Technical High School at Springfield, Massachusetts. Mr. Mathewson is widely known as the author of "Notes for Mechanical Drawing," and during the past year, as president of the Council of Supervisors of the Manual Arts. Besides being a thorough school man, Mr. Mathewson has had practical experience as a machinist and tool maker. For eight years he was designer and draftsman for the Lamb Manufacturing Company.

Judson L. Stewart is in charge of the woodworking shops. Mr. Stewart has had practical experience, is a graduate of the Dayton Manual Training School, and has just received his manual training teachers' certificate at Teachers College, Columbia University. Mr. Stewart's assistant will be Harrison A. Hutchins.

In the forge shop, James D. Littlefield will be in charge. He was prepared at the Boston Mechanic Arts High School and the Massachusetts Institute of Technology. For four years he was assistant in forging at the Institute and during the past year has been in charge of the forging at the Central Manual Training School in Cleveland. Mr. Littlefield has also had a number of years of practical experience.

John Vickerman is in charge of the machine shop. He has had nine years of practical experience, has done college work at Wheaton, Illinois, and Columbia University and two years' teaching experience at the Burt Manual Training School at Saginaw, Michigan.

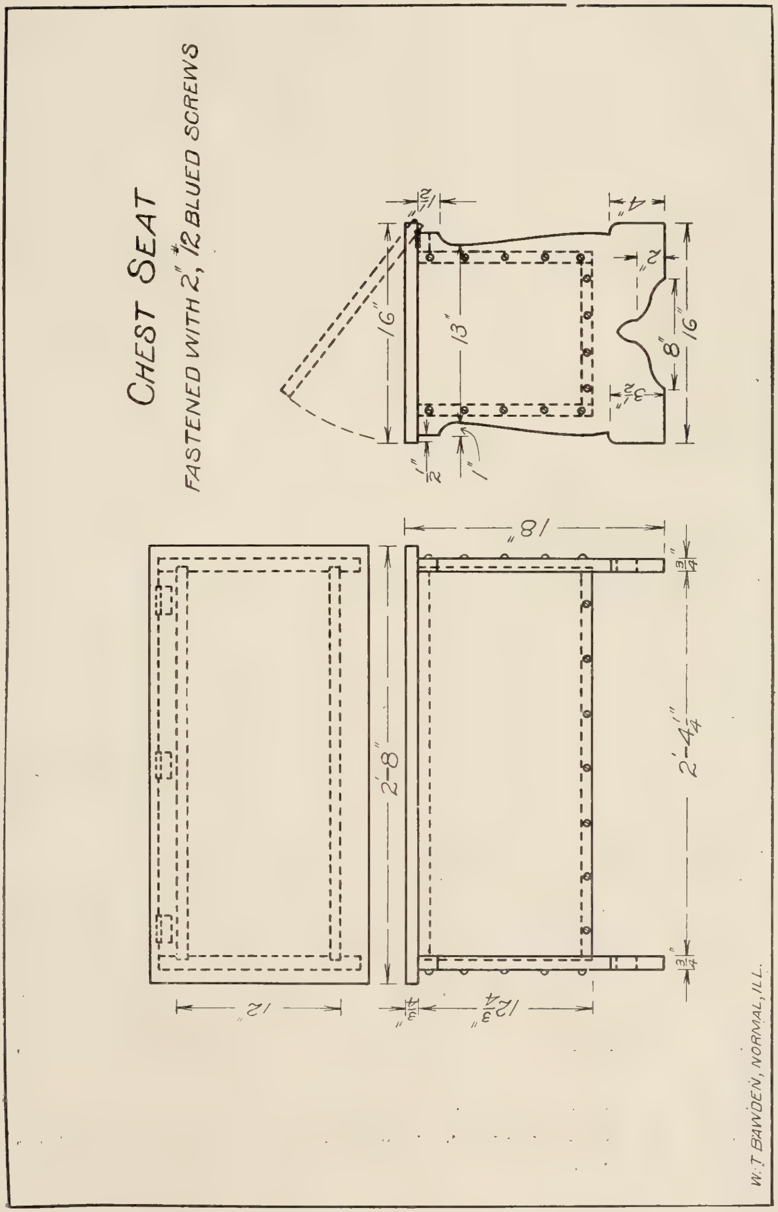
In the department of industrial art, are Miss Mary B. Hyde and A. D. Kennedy. Miss Hyde comes from Teachers College, Columbia University, where for several years she has given instruction in elementary handwork. She is a graduate of the Norwich Art School and Pratt Institute. Mr. Kennedy is a normal school graduate, has taught in LaSalle, Illinois, in the Horace Mann School, New York City, and during the past year has been one of the art teachers in the Cleveland public schools.

The pottery department is in charge of R. G. Cowan, a practical potter who has been a student and later an assistant at Alfred University.

The domestic science work will be under the direction of Miss Carlotta C. Greer. Miss Greer is a graduate of Drexel Institute, has taught chemistry, and for several years has been in charge of the domestic science department of the State Normal School at Pittsburg, Kansas. She will be assisted in cooking by Miss Ethel K. Streibert, a graduate of the State Normal School at Potsdam, New York, who has taken her A. B. degree at the University of Michigan and a B. S. degree at Teachers College.

Miss Lanna Bishop is in charge of the sewing and dressmaking. She is a graduate of Teachers College, who has had fourteen years' experience in teaching, the last four having been in the Boston Trade School for Girls.

Miss Charlotte Trowbridge, also of this department, is a graduate of the Toledo Manual Training School, Manhattan Trade School for Girls, has done work at Columbia University, and has had practical experience in a wholesale millinery house.


CHEST SEAT
FASTENED WITH 2", #12 BLUED SCREWS
W. T. BAWDEN, NORMAL, ILL.

Miss Eunice Bannister, for several years supervisor of drawing in Peoria, Illinois, has become the wife of Judge Frederick C. Perkins of Durango, Colorado. Miss Nama A. Lathe of Bloomington, Illinois succeeds Miss Bannister as supervisor of drawing and will be assisted by Miss Janet Grant, recently a student at the Art Institute in Chicago.

Miss Sara M. Suydam is in charge of the manual training and drawing work at Ridgefield Park, New Jersey. She is a graduate of both the manual training and fine arts department of Teachers College.

After a year of study at Teachers College, Miss Mary Story returns to Oakland, California to teach manual training in one of the public schools.

Miss Anna B. Ireland, is to teach manual training and drawing in the schools of Collinswood, New Jersey.

Miss Nellie B. Baker, after spending one year at Teachers College and receiving the diploma in manual training, returns to her former position in the Kamehameha Schools, Honolulu.

Austin S. Edwards has accepted a position to teach manual training in Minneapolis.

Ernest C. Amy is to be instructor in woodworking in the Technical High School at Providence, Rhode Island.

Miss Anna la T. Blauvelt, having received her bachelor's degree and manual training diploma at Teachers College, is to teach manual training in the public schools of Oakland, California.

J. Harvey McCloskey is to be in charge of the physical education and some of the woodworking classes at the Newman Manual Training School, New Orleans, Louisiana.

Virgil P. McKinley, who has been spending a year at Teachers College, returns to his former work at State Normal School, Troy, Alabama.

Roy McVaugh is to be supervisor of manual training at Atlantic City, New Jersey.

Miss Stella C. Harris returns to her former position at the State Normal School, Springfield, Missouri, after having received her manual training diploma at Teachers College.

Hugh W. Twaddle has accepted a position as instructor in woodworking at the Hoboken Manual Training School.

Chicago is keeping up its record for innovations in school matters. The latest is a skyscraper school building. The Board of Education have requested their architect, Dwight H. Perkins, to prepare plans for a fourteen-story building to be erected in the downtown district and used for a commercial high school. Incidentally, it will contain the Board of Education offices. The building will probably cost $1,000,000. The school will be patterened after the commercial and continuation schools of Germany.

The Chicago School of Applied and Normal Art has just opened under the direction of Miss Emma M. Church, formerly educational director of Chicago Academy of Fine Arts.

John B. Corcoran has resigned his position in Minneapolis to accept a position as director of manual training in the State Normal School at New Platz, N. Y.

Harry Edick has accepted a position as assistant director of manual training in the schools of Utica, N. Y.

Manual work has been started this year in the schools of Dunkirk, N. Y. with L. E. Banks, formerly of North Tonawanda, N. Y. in charge.

L. O. Asher is teaching manual training at Altoona, Pa.

Miss Mary Waterbury has charge of the art and manual training work in the schools of Red Bank, N. J. this year.

Miss Julia Alexander of Oswego, N. Y. has been called to assist in organizing the manual training work in one of the cities of Maryland.

Emil Wydman has accepted a position in the new Technical High School of Cleveland. He comes from the manual training department of the schools of Grand Rapids, Mich.

William J. Schick, a pioneer in the manual training work of Cincinnati, and for two years in charge of the first intermediate centre has resigned to take charge of manual training in Wyoming, Glendale, Hartwell, and Carthage, four suburbs of Cincinnati.

The following teachers have been added to the corps of instructors in manual training at Columbus, Ohio—Frank L. Mott of Stout Institute, Menomonie, Wis.; Thomas R. Stahl of Hackley Manual Training School, Muskegon, Mich.; George R. Frank of the State Normal School, Gorham, Me.; in domestic science, Miss Theo Fenton of Stout Institute, Miss Ella Jones of the State Normal School, Ypsilanti, Mich.; Miss Charlotte Lowell of Westbrook, Me.; Miss Grace Cockins of the Ohio State University; and in industrial art Miss Christinie Wood of Teachers College, New York City.

Miss Mary Alice Wright, formerly of Bloomington, Ind. and Bayard Faber are new teachers of manual training in Indianapolis. Miss Martha Metcalf and Miss Krueger are new teachers of cooking in the same city.

A. J. Roush of Clearfield, Pa., and Jesse F. Rees are new manual training teachers in the grade schools of Detroit. F. C. Steltz takes Mr. Roush's place at Clearfield.

Louis Gunther of Grand Rapids has accepted a position as instructor in benchwork in the Grand Rapids, Mich. schools. Mr. Gunther is a woodcarver by trade, having been with the John Widdicomb Furniture factory of the same city, for a number of years. Another new manual training teacher in Grand Rapids is Francis N. Bardwell who comes from Bordentown, N. J. In the domestic science department Alice C. Godwin returns after a year's advanced work at Teachers College. Madge Stewart of Kingston, Mich. is a new teacher in the same department. F. W. Chapel has resigned from the staff of the Calumet Schools to become director of Manual Training at Manistee, Mich. J. E. Foulds takes Mr. Chapel's place at Calumet.

E. H. Whitesitt is teaching manual training at East Chicago, Ill.

Robert Craig who has been assistant teacher of manual training at Oak Park, Ill. for the past two years is now attending Bradley Institute at Peoria, Ill.; Tasso Lindsay is his successor at Oak Park.

The following changes have occurred in the manual training department of the Stout Training Schools: Louis F. Olson has gone to Madison, Wis. to introduce manual training in the high school of that city; H. D. Brundage who has been

a teacher at Stout for three years is supervising manual training in the Horace Mann School in New York City; Geo. M. Brace, formerly director of manual training in Duluth, is teaching mechanical drawing and furniture construction at Stout, and William T. Elzinga, for the past four years at Colorado Agricultural College, has charge of the forge and copper work.

Victor Thompson, a graduate of Stout, has been chosen to take charge of the manual training work in the new manual training high school at Grand Rapids, Wisconsin.

Austin S. Edwards and Ernest Reynolds are new teachers of manual training in the schools of Minneapolis, as is also Guy Lander who the last two years has been at Rockford, Ill. His position at Rockford is filled by W. H. Haupt.

Terrence W. Gilbert has returned from an extended trip along the Pacific coast, where he spent some time visiting schools in California, Oregon, Washington and British Columbia. He also spent much time studying the arts and crafts of some of the noted Indian tribes of the Northwest. Mr. Gilbert is the manual training instructor in the Adams School, Minneapolis. Manual training was started in the high school at Pipestone, Minn., this fall. Elementary woodwork, furniture construction and mechanical drawing are taught by C. A. Steelsmith who is in charge of the work.

Manual training work is being started this year in the State Normal School at Mayville, N. D. H. F. Butterfield of Pittsburg, Kan., has charge of the work.

James Edwin Addicott, who has been principal of the Isadore Newman Manual Training School at New Orleans for the past four years, has found it necessary to give up his work on account of the poor health of his family. During these four years the pay pupils have increased from twenty-four to two hundred and nine. He expects to make his future home in California.

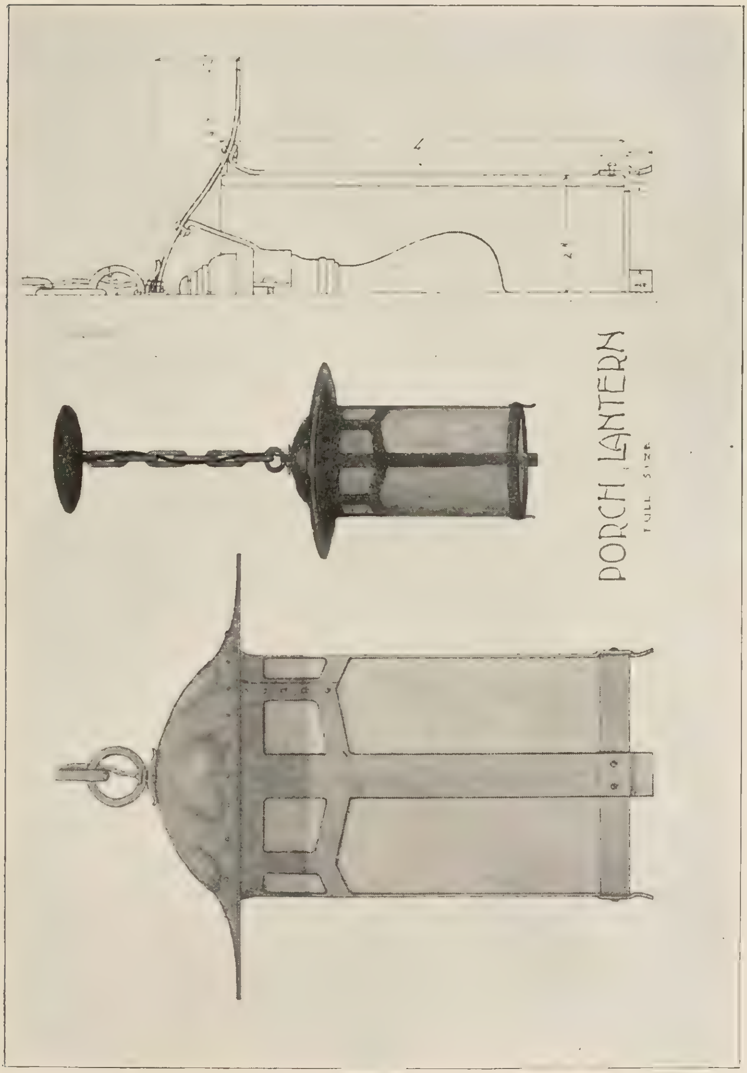
N. S. Hunsdon, who is the pioneer in the manual training work in Texas, after eleven years as director of the work in Austin has resigned to take the directorship of the work in the San Antonio public schools. San Antonio is now the largest city in Texas and during the next few years intends doing some extensive work in manual tarining.

There is to be a new manual training building at the high school where a complete course for both boys and girls will be given. The work in the grades will be more fully developed, thus giving a complete course from the first grade through the high school. Edward Blackburn, who was a teacher in the Allan Manual Training School, has been chosen to fill Mr. Hunsdon's place at Austin, and Victor Smith a graduate of the Allan Manual Training School, has been elected to fill the vacancy created by Mr. Blackburn's promotion.

El Paso, Texas, started manual training this fall. Edwin A. Ross, formerly of Greeley, Colo., is supervisor of the work.

Miss Adele Hofstetter will have charge of the manual training work in the Kaufmann, Tex. public schools during the coming year.

E. E. Balcomb, formerly in the Southwestern Normal School at Oklahoma, has been appointed to the "Chair of Agriculture in Schools" in the Agricultural and Mechanical College at Stillwater, Okla. Among other duties he is supervisor of agricultural and industrial education in the public and normal schools of the



DESIGNED BY P. J. HAWK, SUMMER SCHOOL, BRADLEY POLYTECHNIC INSTITUTE.

state. This new state is preparing for the future development of manual training in its educational system by employing special teachers in all institutions maintained by the state. In the Southwestern Normal at Weatherford, L. P. Whitcomb has charge of the work; in the Central Normal at Edmund, L. C. Petersen is in charge; at the Northwestern Normal, Clark Woodward is in charge and at the University Preparatory school at Tonkawa, E. C. Bohon is in charge. Several high schools in the state are installing equipment for manual training, especially woodwork, and two have already organized the work; the one at Oklahoma City is in charge of S. G. Newell and the Logan County High School is in charge of S. Parlette.

E. J. Huntemer who was at Columbus, Neb. last year, has gone to Wayne to take charge of the new department of manual training in the Nebraska Normal College, where equipment has been provided for bench, lathe and forge work.

Manual training was started this year at Durango, Col. with A. E. Carr in charge.

J. Raymond McNeel is directing the manual training work at Baker City, Oregon.

Among the new appointments of manual training men in Wisconsin are Eugene H. Harlacher, Eau Claire; Charles W. Byrnes, Green Bay; Ray D. West, School of Agriculture, Menomonie; Thomas Rees, Racine, and Newton Van Dalsen, Neenah.

Work at Salt Lake City is progressing along manual training lines and this year every pupil of the grammar grades will be given systematic instruction in either bench work or sewing. Manual work is also given in the high school. Eight new shops were erected the past summer at schools in different parts of the city and others will be erected later. M. N. Hough, a graduate of Purdue University is a new teacher in the manual training department of the high school and A. O. Soderberg, Miss Foushe, Mrs. Sarah E. Karrick and Miss Laura Foster are new teachers of manual training in the grades.

Miss Culter who has been at Ocean Park, Cal. goes to Santa Monica, Cal. to teach manual training while Miss McRaye has changed from Santa Monica to Long Beach of that state and Mrs. Dutton changes from the same city to Pasa dena.

John W. Curtis after two years experience in the Phillipines returned to the States several months ago to complete his course at Bradley Polytechnic Institute. This year he is in charge of the manual training work in the high school at Helena, Mont.

Manual training was started this year in Hoquiam and Aberdeen, Wash. The work in both places is to be carried on by W. L. Greenleaf.

W. J. Warters, Superintendent of Manual Training in the Winnipeg schools has recently returned from a three months trip through the United States where he was studying plans and equipments in a large number of the leading manual training schools. The information gained will be of service in the organization of the proposed manual training high school, which will cost about $175,000. Clay modeling and simple wood-carving are taught in two of the elementary schools of Winnipeg, while in the other schools the system which has been found so satisfactory in the New York schools has been introduced. The end of the

present year will see some form of manual training in every grade below the high school. Two new wood working centers were opened in September. J. H. Murdon of Leeds, England, has joined ths staff of teachers. A special course in mechanical drawing is given in the eighth grade.

Miss Ruth Ayers, who has been instructor in Sloyd in the public schools of Newton, Mass. since April, 1901, has gone to Englewood, N. J. as supervisor of manual training in the public schools of that city. Miss Ayers is a graduate of the Sloyd Training School, Boston, Mass.

In the list of American teachers who are to visit English schools this fall under the auspices of the National Civic Federation we notice the following names: Herbert I. Weaver, principal of Girls' High School of Practical Arts, Boston, Mass.; Gilbert B. Morrison, principal of McKinley High School, St. Louis, Mo.; Bert Le Suer, director of Manual Training Boys High School, Reading, Pa.; Charles D. Larkins, principal of Manual Training High School, Brooklyn, New York; Benjamin W. Johnson, Director of Manual Training, Seattle, Wash.; Mrs. Ida Hood Clark, supervisor of Elementary Manual Training, Milwaukee, Wis.; Frank H. Ball, supervisor of Manual Training, Cincinnati, O.; August Ahrens, director of Manual Training, State Normal School, Warrensburg, Mo.

Last spring the Stout Manual Training School, the Stout School for Home Makers and the Stout School for the Preparation of Teachers in manual training, domestic art, kindergarten and primary work were incorporated under the name Stout Institute. This step was taken for the purpose of extending the scope of the work already begun and for providing additional facilities for industrial education. As the first step toward the realization of the higher purpose of the work, the Board of Directors announced the opening of a new trade school for plumbing and gas fitting and brick laying. It is believed by the directors of the school that the small city of Menomonie is a more favorable location than a large city for this type of school. Men engaged in industrial education throughout the country will watch with interest the development of this new addition to the already famous groups of schools founded and maintained by Hon. J. H. Stout.

The Anna S. C. Blake Manual Training School of Santa Barbara, California has recently completed a new building which has been provided with a modern equipment. This school, which was the first on the Pacific Coast has now taken up the work of training teachers of manual training and has been given the standing of an accredited normal school by the State Board of Education.

The city of Davenport, Iowa has recently equipped five new grade centers and will give woodwork to the boys of the seventh and eighth grades and sewing to the girls. The boys of the ninth grade have woodwork at the high school building and the girls of the same grade have cooking. Action taken during the summer makes it possible for the boys of the high school to elect a four-year manual training course which will include ten periods each week in shopwork and drawing, arranged in double periods of 90 minutes each. The work in pattern-making and metal work will be added as soon as the boys of the present year are prepared for it. Isaac H. Barbee, a graduate of Purdue, is to take the new classes in mechanical drawing. Charles A. Gesell of Indiana State Normal, Terre Haute, has the work in the grade centers. Prospects are very bright for manual training in the Tri-cities, Davenport, Rock Island and Moline.

REVIEWS

The Furnishing of a Modest Home. By Fred Hamilton Daniels, director of drawing, public schools, Springfield, Mass. The Davis Press, Worcester, Mass., 1908. 8½x5¾ in., pp. 114, with 48 half-tone illustrations; price, $1.00, postpaid.

Thousands of people have been conscious of the need of just such a book and tens of thousands more need it though they have not yet become conscious of the fact. Surely this excellent book on good taste in the home has a mission.

So well has the author done his work that the book makes many of the complex questions of taste and fitness in house furnishing seem very simple matters, yet in doing so he has not been dogmatic. In an unusual degree, for books on art, this one appeals to common sense. It gives you a basis for selecting the colors for the walls of your rooms, coverings for your floors, the finish of your woodwork, the selection of furniture, pictures and other decorative objects. It discusses the several rooms in the house in a helpful way.

Not only is this a valuable book for every homemaker but for every teacher of the manual arts for he is training homemakers for the future. We know of nothing on the subject "so simple, so direct, so suggestive, or so convincing" as this little book. —C. A. B.

Mechanical Drawing for Trade Schools. By C. C. Leeds, Assistant in Carnegie Technical Schools. D. Van Nostrand Co., New York, 1908. 8x11 in., oblong; 31 plates with notes on opposite page; price, $1.25.

A Practical Course in Mechanical Drawing. By William Fox and Charles W. Thomas both members of the teaching staff of the College of the City of New York. D. Van Norstrand Co., New York, 1907. 5½x7¾ in., pp. 98; illustrations scattered throughout the text; price, $1.25.

If one were searching for striking contrasts in books on mechanical drawing he would most certainly be content as soon as he began to study these two books side by side. In one respect they are similar; they bear the imprint of the same publisher. In almost every other respect they are strikingly different. One is longest horizontally; the other vertically. One contains full-page plates; the other small drawings in the text. One book, Mr. Leeds', presents to the student the highest standard of technique—as perfect drawings as we have ever seen in any book on mechanical drawing—and keeps them before him as a standard to work toward; the other presents faulty drawings in the belief that "their very imperfections are such as to encourage the student, since he feels that he can do at least as well as the designer."

Mr. Leeds says, "The author's conviction that the use of models serves to develop copyists and often tends to stunt or destroy a draughtsman's creative faculties, has led him to discard entirely the use of models in teaching mechanical drawing." Fox and Thomas say, "The subject is best taught with the use of models, instead of sketches and pictorial illustrations. The result of the instruction will then be real instead of imaginary. Since the student knows absolutely what his drawings represent, and need not rely on an untrained imagination."

After comparing such statements, who will not say there is need of more clear thinking on methods of teaching mechanical drawing? It is evident that both these authors are wrong and both are right, but neither one all the time.

In the first place, it is necessary to set a high standard of technique and to give explicit but not voluminous directions for using the instruments. Mr. Leeds deserves high praise for the way he has done this.

In the second place, unless Mr. Leeds' course takes it for granted that the students in his classes have previously drawn from models or are mechanics, familiar with machinery or have come in contact with forms similar to those he presents, we cannot agree with his practice of eliminating all models. In the earlier stages of the subject at least a real model clears away many cobwebs of abstraction which are apt to be so entangling. On the other hand, to use models in every lesson, advanced as well as elementary, is certainly to restrict the training to the lower type and cannot develop "creative draughtsmen."

In the hands of a wise teacher who gives supplementary or substitute problems and changes these from year to year, so that his work does not become crystalized into mere copy work, Mr. Leeds' book is excellent for the purpose indicated in its title. The book by Fox and Thomas, though it is intended to cover about the same grade of work, is too defective in several important essentials for a satisfactory textbook. —C. A. B.

Textiles and Clothing. By Kate Hientz Watson. American School of Home Economics, Chicago, 1907. 8x5½ in., pp. 244; price $1.50 net. This is one of a dozen books already published in the "Library of Home Economics" series. About half of the book is given to textiles and the remainder to sewing and simple dressmaking. It begins with the origin and methods of spinning, illustrating these very fully; then takes up weaving in a similar manner. Fibers—cotton, wool, flax, and silk are then presented, using some excellent illustrations. Modern methods of spinning, weaving, dyeing, printing and finishing are discussed and fabrics classified by their trade names. The second part treats of different stitches and their uses, machine sewing, garment cutting and making and cleaning and repairing. The book also contains a selected bibliography.

This book not only presents the historical and the practical, but also the art side of the subject. It is the first satisfactory textbook on textiles that we have seen. —C. A. B.

The New Education Manual Training Woodwork. By Richard Wake. Chapman & Hall, London, 1901. 9x6½ in., pp. 360; price $2.75.

This book by an English teacher of manual training has been read but little in America. It is not a book that is likely to be followed in every detail by many American teachers, but it contains many helpful suggestions. The method it sets forth is interesting because it is written in the belief that "to obtain the full value of manual training, the child must be taught from the beginning to design and invent his own models." But in this statement the emphasis is placed on the word "taught," for Mr. Wake does not expect children to "design and invent" good models without being taught, as we fear some of our American teachers do.

Instead of requiring each individual child to design a model he develops the essential characteristics of a given model by means of questions to the class.

It is, then, a method of developing ideas through class recitation work rather than a strictly creative or design method.

The book gives this method very fully, even, to many of the questions which should be asked in each lesson. The course covers three years, for each of which is a series of lessons on "drawing and benchwork, tools and timber."

It may be doubted whether the development method should be used so exclusively as seems to be indicated by Mr. Wake, but certainly the study of this book ought to be helpful to many young teachers who are weak in their class instruction and to students of methods of teaching manual training. —C. A. B.

The Book; Its History and Development. By Cyril Davenport. D. Van Nostrand Company, New York, 1903. 8¼x5½ in., pp. 258; price $2.00.

This book contains a chapter on each of the following topics: Early records; rolls, books and bookbinding; paper; printing; illustrations; leathers; the ornamentation of leather bookbindings without gold; the ornamentation of leather bookbindings with gold. The book is written by an English authority on the subject and is well illustrated. It contains a great amount of information of value to teachers who are giving instruction in the elements of book-making, printing or bookbinding. Chapter two, for instance, shows clearly the evolution of the modern book from the ancient roll. Each step in the development is illustrated: (1) roll written across, (2) roll written longitudinally, (3) roll written in page form, (4) a folded roll, (5) "stabbed" roll or Orihon, (6) threaded quaternion, (7) threaded quaternion tied on to transverse band, (8) modern sewing. The book presents the results of extended research.

The Applied Arts Drawing Books. Edited by Wilhelmina Seegmiller. Atkinson, Mentzer and Grover, Chicago, 1908. Autumn and Winter Term Books for years three to eight inclusive. Price, third and fourth year books, 10 cents each; fifth, sixth, seventh and eighth year books, 15 cents each.

As one looks over these books it is diffiicult to make a critical analysis of their contents because his thoughts are constantly led astray by the beauty of the pictures. First it is by a page of animal drawings by Ernest Thompson Seton, then by landscapes in black and white by Innes, Corot, or Chaigneau, by choice Japanese brush drawing, or most diverting of all, the color reproductions of rich tiles, rare textiles, fine old illustrated texts and landscapes by Corot, Connoyer, Troyon, and others. Such excellent color reproductions we have never before seen in a drawing book and rarely in any kind of a book.

A drawing book sets an art standard in the school where it is used. Some set a very low one, but Miss Seegmiller's is sure to set a remarkably high one. It is possible to lead pupils to see and appreciate beauty if you have beautiful things for them to study and a beauty-loving teacher to present them. These books provide much beautiful material and will stimulate not only the appreciation but also the expression of beauty. Another fact of importance is that the editor has provided material, not merely to look at, but to make use of in construction work. It was a happy thought to furnish a drawing book to be cut in pieces, page by page or figure by figure, and each part utilized in some way in construction. Even the covers are to be used in this way. At the end of the term instead of piles of dog-eared drawing books on exhibition there will be portfolios of drawings and dozens of booklets and calendars and dainty gifts, each with

a spot of beauty upon it and each will continue to carry its message long after the same material would have been forgotten if kept hidden away in a drawing book.

These books are also rich in suggestions for applied design. —C. A. B.

The Constructive Interests of Children. By Ernest Beckwith Kent, Supervisor of Manual Training, Jersey City, N. J. Published by Teachers College, Columbia University, New York, 1907. 9½x6 in., pp. 78; in paper covers; price, 50 cents.

This is a thesis presented for the degree of Ph. D. at Columbia University. It consists of two parts: (1) The free constructive work of 150 school children, (2) the early interests and education of 72 talented engineers. As stated by the author in his preface, his thesis is the record of "a quest for additional data upon the question of what problems are most likely to prove absorbing to children in the latter half of the elementary school period."

The thesis is of interest to manual training teachers not so much, perhaps, on account of the results obtained as on account of the classification and methods employed in the research and the testimonies of the engineers. However, it may be of some value to know that in a group of 152 boys, 64 were most interested in making boats while only 9 preferred bows and arrows; 28 would make contrivances for animals, while only 3 would make guns.

Toward the end of the thesis, Dr. Kent says, "If the 12-14 year old boy so regularly chooses to make these things, the school should evidently recognize this interest as far as is possible—as far, that is, as may be done without sacrifice of educational ends. To the writer it seems quite obvious that in the making of courses of study in handwork, much more attention might be given to the interest of the child than is done at present."

As indicated before, the thesis is chiefly valuable to teachers as revealing in detail a method of scientific research which has been applied to a manual training problem. —C. A. B.

Educational Woodwork for Home and School. By Joseph C. Park, State Normal School, Oswego, N. Y. The Macmillan Company, New York, 1908. 7¼x5 in., pp. 310; price, $1.00, net.

This is a textbook intended to be used under the direction of a skilled instructor. The book includes chapters on manual training, woodworking tools, woodworking machines, wood, fastening devices used in wood construction, wood finishing, exercises, wood-turning. There are also appendices giving (a) key to the more important woods of North America, (b) problems in construction and geometric helps, (c) useful tables.

The following have been received:

Report of Committee on College Entrance Credits. The Western Drawing and Manual Training Association. This report has been printed in three colors by the students of the Hackley Manual Training School, and a large number of copies have been turned over to the chairman of the Editorial Board for free distribution. Thanks are certainly due to Principal Cotter and the authorities of the Hackley School. Everyone interested in more definite standards in manual training courses would do well to procure a copy of this report. Address William T. Bawden, State Normal University, Normal, Ill.

Beobachtungen uber den elementaren praktisch-techn. Unterricht in Amerikanischen Schulen und auf der Unterrichtsausstellung in St. Louis, 1904. By Dr. Alwin Pabst. Frankenstein & Wagner, Leipsig, Germany, 1907. This account of American manual training schools by the director of the Leipsig Training School for Teachers of Boys' Handwork is illustrated by 16 halftones showing several types of work and equipment.

New Jersey State Teachers' Association. Proceedings of 53d annual meetings held in Atlantic City, December 26 to 28, 1907. This report contains the following: "Vocational Education," by Professor Paul H. Hanus; "The Industrial Educational Movement and the Elementary School," by Henry Turner Bailey; "Reorganization of the Elementary School System," by David B. Corson; "The Study of a Typical Industry as a Basis of Manual Training," by Cheshire L. Boone.

Western Drawing and Manual Training Association. Proceedings of meeting held at Indianapolis, April, 1908. William T. Bawden, Chairman of Editorial Board, State Normal University, Normal, Ill. Price, 50 cents. Contains addresses by William O. Thompson, Charles A. Bennett, Arthur W. Dow, Walter S. Perry, Frederick L. Burnham, Mary S. Snow, Edward J. Lake, and others; also reports and classified list of members.

Proceedings of the Department of Superintendents. National Educational Association. Dr. Irwin Shepard, Secretary, Winona, Minnesota. This contains a full report of the symposium on the "Place of Industries in Education," which took place at the Washington meeting last winter. Among the speakers on that occasion were Dr. James E. Russell of Columbia University, Professor Edward C. Elliott of the University of Wisconsin, James F. McElroy, Albany, New York, Miss Euphrony E. Langley, University of Chicago, Charles H. Morse, Secretary of Massachusetts Commission on Industrial Education, and Secretary George H. Martin of the Massachusetts State Board of Education.

Cleveland Public Schools. The annual report of Superintendent W. H. Elson. This report discusses the reorganization of school work that is now taking place in Cleveland and gives considerable space to manual training and drawing work and to the new Technical High School. The report is illustrated by several photographs of pupils' work.

Manual of Cardboard Construction. By Robert J. Leonard, Supervisor of Manual Training, Berkeley, California. This is a 32-page pamphlet prepared by Mr. Leonard for the assistance of the grade teacher. It treats the subject under the following heads: Current opinion and practice, what to present, design, accuracy, definite processes, method of presentation, use and selection of materials, and suggestive list of projects.

The Theory and Practice of Teaching Art. By Arthur Wesley Dow. Teachers College Record for May, 1908. Price, 20 cents. A most attractive presentation of Professor Dow's work at Teachers College.

The A B C of Lettering for Public Schools. By Schuyler Bull, 464 Averill Ave., Rochester, N. Y. Four plates and a brief text. Price, 16 cents.

Trade School for Plumbing and Gas Fitting and Brick Laying. Stout Institute, Menomonie, Wisconsin. An interesting prospectus of a new school beginning work this fall.

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MANUAL TRAINING MAGAZINE

DECEMBER, 1908

THE EDUCATIONAL VALUE OF THE ESSENTIALLY MOTOR ACTIVITIES.

JEAN L. GOWDY.

WE HAVE learned that there are periods in the life of every child when his nervous system is ready for training along the line of certain activities, and when the forces stored up will render the largest dividends in future enjoyment and usefulness. If the training necessary to develop these activities, and to store up these surplus forces is delayed beyond the period when natural growth may be secured, it generally proves useless, and just so much of life's capacity for enjoyment and usefulness is wasted.

Life does not hold so many pleasures and opportunities that we can afford to lose any of them—we need them all to make it complete.

"There are no blanks in honorable life." Every one was meant to be successful and happy. There is a place for everyone and the failure to find this place makes the downcast, plodding, unsuccessful man much oftener than lack of ability.

When life is a dull monotony there is something radically wrong. No occupation should be to the one who follows it simply an irksome treadmill. Every man should see in his daily life work something beyond its daily routine, and should feel a desire and determination to break thru this routine into higher experiences. I believe the children and the youth who receive the proper training just when they are ready to profit by it, that is, when the nervous system is ready to store up surplus forces for future use, are the ones who grow to be men and women who find enjoyment in their vocations, and who recognize and seize opportunities as they come.

It is truly said that children need to feel greater respect for labor in general. One of the first educational moves our government made in the Philippines was the establishment of an industrial school at Iloilo on the island of Panay that the idea of the dignity of labor might be created in the minds of the inhabitants. The technical and industrial schools of Argentina, which are supported by the government, are said to be rapidly winning the favor of the people of that country, as the youth who go out from these institutions show such marked evidences of being well equipped to cope with industrial and commercial problems. This training is also much needed in our own country. Creating in the children a desire to do, and letting them learn by their own experiences in doing what our necessities and luxuries cost in the time of the hand, seems to me the best method of teaching them to respect labor. They will also learn in this way to know that behind the intelligent work of the hand is always, thought, feeling and desire for expression. Manual training and manual labor will not then mean to them simply hand training and hand work, as the names would indicate, but mind training and mind work as well. Good manual training means such education of the child's inborn desire for activity that it shall result in skill and self-control. Failure to train this activity at the proper time must result in wasted energy, lawlessness, weakened and often vicious wills. Thus the tramp and criminal are often born.

Statistics show that thirty-three per cent of our population in the cities are engaged in some kind of hand labor—this includes tool and machinery work—while little more than four per cent are professionals. Still we give only about a tenth of our time in school to hand training. Does this seem a just division?

Home industrial training for boys especially in our cities seems entirely cut off. Most of the things formerly required of them are now done by machinery or by their parents, in mistaken kindness; there seems nothing left for them to do in the home, and our strict labor laws prohibit them from doing work outside of the home. Still the demand for skill and efficiency is greater than ever. The schools are constantly asking the children what they know, when "What can you do?" is ever the question confronting them in practical life. Skill and efficiency raise all work above monotony and drudgery. The man who is skillful and efficient will never find his work a dull, monotonous routine.

In reality the question is not what should the schools do for the children? The schools cannot hope to fit the children, with their widely different natures, to be successful in all their undertakings; but it is what should the schools and the parents inspire the children to do for themselves? It is the constantly having something done for them —getting something for nothing in return, both at home and at school, that is impairing their perseverance and their independence, and destroying their originality.

We appreciate the value of perseverance and independence, but do we always appreciate the value of originality? I sometimes think we do not wait for the children to develop, but we carry them along with the currrent of our own ideas until they lose their own identity and become only mediocre beings producing something worthy, no doubt, but not their own. The original man has powers that prohibit him from being confined within the limits of any single occupation. There is always a power within him that may lead him beyond the demands of his work. This brings independence. The world then becomes to him an open field; he can demand his own price. To be original a child must be allowed to exercise his powers unhampered. He must have a chance to work out his own problems. I believe good manual training—I do not here mean benchwork alone but handwork in general—will do much toward cultivating this invaluable trait.

Marden, in "Every Man a King," says, "The men and women who render the greatest service to the world have done so by seeing in their imagination something infinitely better than actually existed and working to make this real." And Mark Hopkins says, "The wise man is the man who knows what is worth having and how to get it; what is worth doing and how to do it; what to aim at and how to hit it."

Knowledge alone is not power, and the simple acquiring of facts is not growth. We have all known many people with almost infinite stores of knowledge who never caused anything to come to pass. Without efficience and executive ability knowledge can do nothing save to gratify the person who possesses it. When I see people who are constantly acquiring knowledge simply for self gratification, I am reminded of Bret Harte's description of Cadet Gray:

> "Ah me! it was, in sooth, no ruddy child,
> No brawny youth that thrilled the father's pride—
> 'Twas but a Mind that somehow had beguiled
> From soulless Matter processes

> For speech and motion and digestion mild,
> Content if of all one moral purpose served,
> Nor recked thereby its spine were somewhat curved.
> He was scarce eighteen, yet ere he was eight
> He had despoiled the classics; much he knew
> Of Sanskrit, not that he placed undue weight
> On this, but that it helped him with Hebrew,
> His favorite tongue. He learned, alas! too late,
> One can't begin too early, would regret,
> That boyish whim to ascertain the state
> Of Venus' atmosphere, made him forget
> That philological goal on which his soul was set."

We certainly need scholarship as much—yes, more than ever; we must have systematic mind training that we may have systematic hand training, but the application of knowledge should ever go side by side with the acquisition of it, as it is doing that makes knowing a reality. We have, however, long since discarded the idea that a culture subject must necessarily be one that will be of no use in practical life. "Man is developed and cultured not only by what he receives and absorbs from without, but much more by what he puts out and unfolds from himself." We are at our best only when self expression is complete.

Language is only one medium of expression, and we often find it inadequate. Drawing, the pioneer in hand training, is another; this, too, sometimes fails; often the industrial or manual training work seems to be the only medium of expression that really satisfies. I believe the industrial work as planned for the primary, fourth and fifth grades, comprising weaving, clay-modeling, constructive drawing, sloyd and sewing is good—an excellent beginning, altho I would like to see more time given to the last two subjects especially.

I am not, however, so sanguine about the work as generally planned for the sixth grades. By merely allowing one period a week for sewing and sloyd we shall not, I am very sure, adequately provide for the needs of these children. We need to reconstruct the course of study for children of this age. We often find in this grade a clogged condition. The dull or the abnormal boy advances so far, from necessity often, and gets no further. School becomes about this time distasteful to him on account of his many failures and his inability to take the work of his classes readily. He can not quite see ahead to the finish of the grade work—three years seems an age to him; he is restless, and

he feels that he must get out into the world and become a producer. He is hard to manage at home, and his parents soon tire of his complaints, or think his judgment is superior to their own, and fall by the wayside. The school loses the boy or keeps him under protest, which is sometimes worse, as a boy who simply holds a seat down in school is learning but one thing—to become a loafer. The boy who leaves school when in the sixth grade has but a smattering of arithmetic, geography and history; he is unable to write a good business letter, he is a poor speller, his penmanship is unformed, and there is nothing he knows how to do well. What is there in the future for such a boy? Usually nothing but unskilled labor, poor wages and an unsucessful and discontented existence.

The sixth grade work should meet the demands of the sixth grade pupil, but how? I do not know, but I believe the vocational work should have a beginning here, not with the idea that the children should select their life work at this period of school, but that they should have the chance to find out in what they may become successful. The daily program might be something like the following:

9:00. Music.
9:15. Arithmetic (largely industrial.)
9:45. Spelling and writing.
10:00. Physical Culture—with military drill once a week.
10:10. Arithmetic.
10:45. Recess.
11:00. Reading.
11:30. Language (much attention given to business letters.)
1:30. Drawing—freehand and mechanical; much time devoted to working drawings, because these train eye and hand, teach accuracy, clinch fractions, and save time in manual training lessons.
2:00. Industrial Geography or Industrial History, with much map drawing to illustrate and fix points.
2:30. Recess.
2:45. Benchwork for boys.
Housekeeping Arts for girls.

This program, you will see, provides industrial work for most of the afternoon of each day in the week.

The bench work should be under the direct supervision of a manual training teacher and should comprise a course in simple models that afford short views ahead. The models should be useful articles that would appeal to the children, and be appreciated in the home. It has

been found that between the ages of eleven and fourteen the boys are ready to be most benefitted by manual training with woodworking tools because at this period they are most susceptible to the moral influences which come from work, and the workshop is a delight to them, as they there become producers.

We can neither expect nor wish these boys to choose their life vocations, but we may expect them to find real enjoyment in their work and then become the "radiant boys" of whom Dr. Henderson speaks, "breathing the full breath of life, thinking clearly, feeling deeply, rich in the fine riches of the human spirit, the riches that come from the expanding and unfolding of human faculties." Efficiency not perfection should be the aim.

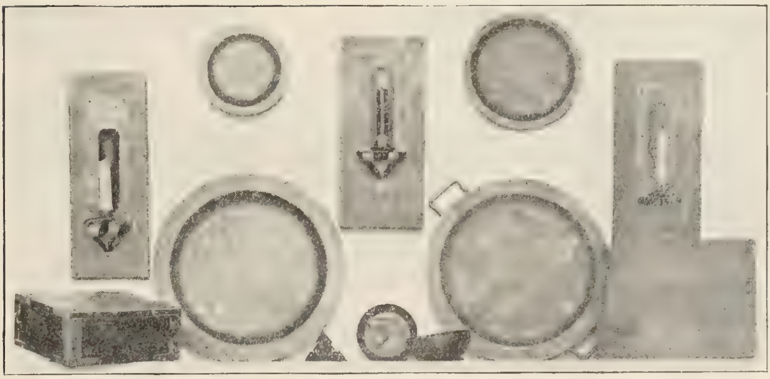
Parents should be urged to help by providing their boys with workshops and woodworking tools at home, that they may reproduce the models made at school, or, better still, exercise their originality.

The housekeeping arts should comprise lessons developing the home ideal; the evolution of the house with consideration of the sanitation, lighting, furnishing and care of each room.

The domestic instinct is usually very strong in girls. They all look forward to having a home of their own some time and most of them take a lively interest in house plans. They should be encouraged to observe and criticise houses in course of construction, and finally to plan a house, drawing it to a scale. Until women learn to intelligently direct the building of their own homes, inconvenient, loudly decorated and often unsanitary houses will be the result. The drawing department gives valuable aid in the study of proper decoration of rooms. In this course of study in housekeeping arts much attention should be given to practical sewing, especially to mending and darning. One or two periods in the week should be given to mending or darning articles brought from home. One of the many practical things said by Colonel Francis Parker was this: "When education penetrates the home and when the home penetrates the school, then things move on."

The sixth grade room should be furnished with a sewing machine, and the girls should be taught to use it skillfully, and to care for it. It seems to me to be a waste of time to teach girls to do sewing by hand that they will never do in this way in practical life. Hand hemming will doubtless be used for generations to come in making table linen and bed linen especially, and basting, overcasting and overhanding will always have their place in hand sewing. Articles should be useful—real things, not models.

If these hand work subjects inspire the boys and girls, as I am sure they do, and lead them on in the path toward successful life, they will give us invaluable aid in all our work. We can never look forward to the time when any subject or subjects in the curriculum will end all of our difficulties. I fear we shall always have with us the boys and girls who can not be interested, and who simply drift, but these cases will become less and less as the gospel of hand training works its way onward.



MADE BY STUDENTS IN STATE NORMAL SCHOOL, MANKATO, MINN.

OTTO SALOMON.—1849-1907.

GUSTAF LARSSON.

AT THE request of the editor of the MANUAL TRAINING MAGAZINE, I have the pleasure of giving a short account of the life and work of my friend and teacher, Otto Salomon, Director of the world-renowned Sloyd Seminary at Nääs, Sweden, who died November 3, 1907, after several months' illness.

It was my good fortune to make acquaintance with Herr Salomon as his pupil at Nääs in 1881-82, where, a few years later, I was engaged as teacher during several of the short courses held there. Frequent visits to Sweden and a continuous correspondence have also enabled me to keep in close touch with the work of Director Salomon and of the various activities developed by him, from first to last. It is with sincere respect, affection and gratitude that I bear testimony to the fact that in the death of Otto Salomon the world has lost one of the most remarkable and most useful men of his time.

Otto Salomon was born at Gothenburg, Sweden, November 1st, 1849, of Jewish parents. His early education was received in the preparatory schools of Sweden, and after passing the necessary examinations in 1868, he entered the Institute of Technology of Stockholm, but left it in the following year to help his uncle, August Abrahamson, in the management of his estate at Nääs, about twenty miles from Gothenburg, where Salomon found a rare opportunity to test some ideas of his own concerning the eduactional possibilities of manual training. In fact, Herr Salomon had discovered more than thirty years ago the culture value of the training, to which President Eliot of Harvard University has just now called the attention of the Summer School at Cambridge and in quoting President Eliot's words just here, I feel that I am giving voice in clear, vigorous English to the earlier message of Herr Salomon.

In speaking of the teaching of music, manual training, and the like, "in public or private schools", President Eliot says, "Shall we call the training of these human vehicles of expression, of impression, of reasoning, of apprehension, of observation—shall we call the training of the hand and eye a fad? It is better worth doing for *culture's sake,* than learning to spell or to know the names of capes, gulfs and capitals of the world—immeasurably better as culture, as training, as giving power."

Now this was the creed of Salomon, who, like his predecessors, Pes-

talozzi, Froebel and Cygnaeus, started an educational movement based upon these ideas which has made itself felt, not only in Sweden, but, to a greater or less degree, in all civilized countries. Herr Salomon was always a progressive leader, and his comprehensive knowledge and pedagogical insight added to a sympathetic nature, made him especially well fitted for the work of his choice. He was conservative in some ways, but also liberal in the best sense of the word. He once said, "Should the day ever come when I arrange a course of work exactly like a previous one, I shall think it right at once to retire and let another take my place." That day never came.

Herr Salomon was a profoundly religious man, quiet and reverent in manner, somewhat slow in speech, but his clear mind, strong will, tender heart and abounding enthusiasm inspired all with whom he came in contact. He had traveled extensively, and had a wide correspondence with some of the most thoughtful and distinguished scholars of his time in many parts of the world. He was also an indefatigable worker. Besides his lectures at Nääs on various educational topics, sometimes three or four times a day, in different languages, Herr Salomon is the author of several books, monographs and articles for magazines upon educational handwork. He was the editor of a series of educational classics, and has translated for his countrymen the works of Comenius Locke, Rousseau, Saltzmann, Pestalozzi, and later, James Freeman Clark's "Self Culture."

From 1885 until recent years he edited the *Slöjdundervisningsblad from Nääs,* a periodical issued twelve times a year, in which he frequently expressed his progressive ideas on the educational possibilities of manual training. While handwork of different kinds, such as is generally carried on in connection with the domestic life of the country, has been skillfully practiced for centuries in Sweden, the sloyd schools, which were established to enrich the general education of children, were established in the early seventies. One of the first schools of this kind was the one started at Nääs in 1872. Here, Director Salomon was able to realize some of his educational ideas. His uncle, the large-hearted and public-spirited philanthropist, August Abrahamson, entered warmly into the scheme of his nephew, and his fortune was devoted to the establishment and maintainance of a school on his own estate at Nääs, which has become an international institution.

The Nääs Sloyd Seminary for the training of teachers was opened in 1874. The purpose of this school was to fit desirable young men for

teaching either in independent sloyd schools or in such as were attached to the elementary schools. The last of these one-year courses, and the one the writer had the privilege of attending, was held in 1881-2 and included mathematics, natural science, pedagogics, psychology, school methods, mechanical drawing, the Swedish language, physics and the study of mechanical laws, besides carpentry, wood-turning, wood-carving and forging, the actual time of study at this time, being fifty-five hours a week. Up to 1882 sixty-two sloyd teachers had been graduated from this one year course. Beginning with the year 1882 the Nääs Seminary for teachers of sloyd adopted a new plan by the concentration of its activity on less comprehensive courses for those teachers who were already engaged in teaching. Up to the end of 1907 not less than one hundred and ten of these six weeks' courses had been held, which were attended by 4,102 persons representing 37 different countries. As a general rule only teachers are admitted. The instruction, tools and materials being free, a small sum is charged for board and lodging. The instruction is both theoretical and technical, with daily lectures and discussions, after the Socratic method, in Swedish, English and German, on the pedagogics of sloyd, psychology, hygiene, aesthetics and the history of education. Lectures are also given in the use of tools, and the significance of sloyd exercises, by special teachers. The technical work, including woodworking, in connection with which is drawing, is carried on in the four large sloyd rooms during seven hours daily, under the direction of the head teacher in sloyd and several assistant teachers. These assistant teachers are often selected for each course by the director, and are drawn from the large number of well educated students. In this way, the instruction is saved from the danger of becoming too much one of routine.

All students are expected to take part twice daily in gymnastic exercises, which are arranged in accordance with the Swedish-Ling system, the importance of the physical development of children being always kept in view by true teachers of sloyd. Since 1895, in addition to the regular sloyd, courses are offered at Nääs in the theory and practice of out-door games, and since 1902 instruction is given in gardening, cookery, needlework and kindred activities.

The last of Otto Salomon's progressive undertakings was the opening of a seven months' course in educational psychology for young women, for the purpose, as he told the writer, of testing some modern methods of teaching. This course was begun in October, 1906, but was

discontinued in March of the following year, on account of the ill health of the director.

Just a word about the founder of this valuable institution at Nääs, and the provisions made for its future maintenance. August Abrahamson, who died at his estate in Nääs, May 6th, 1898, provided in his will that the educational establishment founded by him should be kept up for all future time at Nääs, under the name of the *August Abrahamson Stiftelse* (Foundation), its aim being the continued training of teachers who have already devoted themselves to work for education in general, and especially for the continuance in that institution of pedagogic sloyd. It is also directed that this educational work, as far as its funds will permit, shall always be carried on "in accordance with the progressive demands of the times." The Foundation, endowed with the Nääs estate, together with the personal estate, amounting to something over $100,000, is given to the State. The total value of the Foundation may be estimated at about $200,000. The will further directs that Otto Salomon, the testator's nephew, who has directed the institution ever since its establishment, shall continue his directorship, either personally or by deputy, and be the sole administrator of the Foundation, with unlimited power and authority to direct everything connected with the educational work. Finally, it is the will of the deceased that teachers from foreign lands shall be allowed to enjoy the privileges of the school. By a Royal mandate, dated April 28th, 1899, His Majesty, the late King Oscar of Sweden, in Council, on behalf of the State, accepted the Foundation on the terms determined by the testator, and thus *The August Abrahamson Stiftelse* has been changed from an entirely private establishment to a state institution.

Although sloyd has many enthusiastic advocates, and while it rests on universally recognized educational principles, it is often misinterpreted by well meaning but not well informed people, as being only a special kind of handwork, very limited and narrow in its scope, and not adapted to any other country than Sweden. This misunderstanding is partly due to inadequate study of the principles and practice of this system, and to the short time generally given to the study of educational handwork at some summer or holiday courses at home and abroad, usually from three to six weeks' duration. It is true that the leaders of these courses sometimes emphasize the importance of more serious study of the subject before teaching it, yet a great many ill-prepared persons are set to teaching, whose work often results in failures, and the too

frequent verdict is not that the teacher has failed, but that the system is worthless. Leaders in the cause are now needed, who will be able to convince the thinking public of its importance through actual demonstration and teaching; hence the demand for well educated men and women who will make a thorough study of the comparatively little understood subject. It is the writer's opinion that to secure satisfactory results at least one year's study of the theory and practice in educational handwork is necessary for one who is already a teacher, and that two years of study and practice are necessary for those who have not had a teacher's training and experience.

That sloyd is *practical, and rests upon definite principles,* which are adapted to any country, is best shown by Otto Salomon's own writing, which may be quoted as follows:

"The Nääs system of sloyd was first mentioned in connection with its significance as a system of training in work whose aim was chiefly pedagogical and *not* economic. The two important fundamental rules of this system are in harmony with this idea, as, for instance, the rules that the instruction shall be methodical, *i. e.,* be given in an intelligently methodical way—this, in contrast to the method formerly employed, of allowing chance or caprice to determine what a boy should do. Secondly, the rule that the instruction should be given by a pedagogically trained teacher, and not by the first artisan who offers. According to this method only, will instruction in sloyd become a satisfactory factor in general education. Third, the Nääs system emphasizes the necessity of limiting handwork for a time to one branch of sloyd, that of work with wood being considered most effective. Other important fundamental principles are that the work of the children shall be voluntary, never compulsory, that useful objects shall be made and not articles of luxury, that the instruction shall be individual and not by class teaching, that the articles made shall become the property of the children, and never be sold for the benefit of the school, that work shall be interesting, and carefully executed."

It has been said that before the influence of Herr Salomon was felt in Sweden, manual training was generally carried on there, as elsewhere, with the industrial end chiefly in view, and that this was found to have a crippling effect upon methods and the result thereof. Educational manual training as expounded by Salomon, now stands, among other things, for increasingly high standards of workmanship, a love of good work for its own sake, contempt for poor work, and, indirectly, for contempt for all things which are not true.

This is believed to be the natural outcome, and it can easily be shown to be the frequent outcome of carefully graded work, which puts into a boy's hand at first only such work as he can do reasonably well, the work calling constantly for increase of effort as power is acquired, and resulting in increasing freedom of action and the development of intelligent originality.

That such courses of work are acceptable to boys has been abundantly shown at a large manual training center in Boston, where there is a large attendance from public schools, and requests for the privilege of working at bench out of school hours and on holidays are often more numerous than can be granted.

It may perhaps seem that all the propositions are self evident, and scarcely worth mentioning, but they have never received general recognition in the schools of manual training. It is believed, however, that the time is not far distant when the principles of sloyd advocated by Otto Salomon will be recognized as characteristic of what is best in general education.

MADE BY STUDENT IN ILLINOIS STATE NORMAL UNIVERSITY, NORMAL, ILLINOIS.

THE LONDON ART CONGRESS.

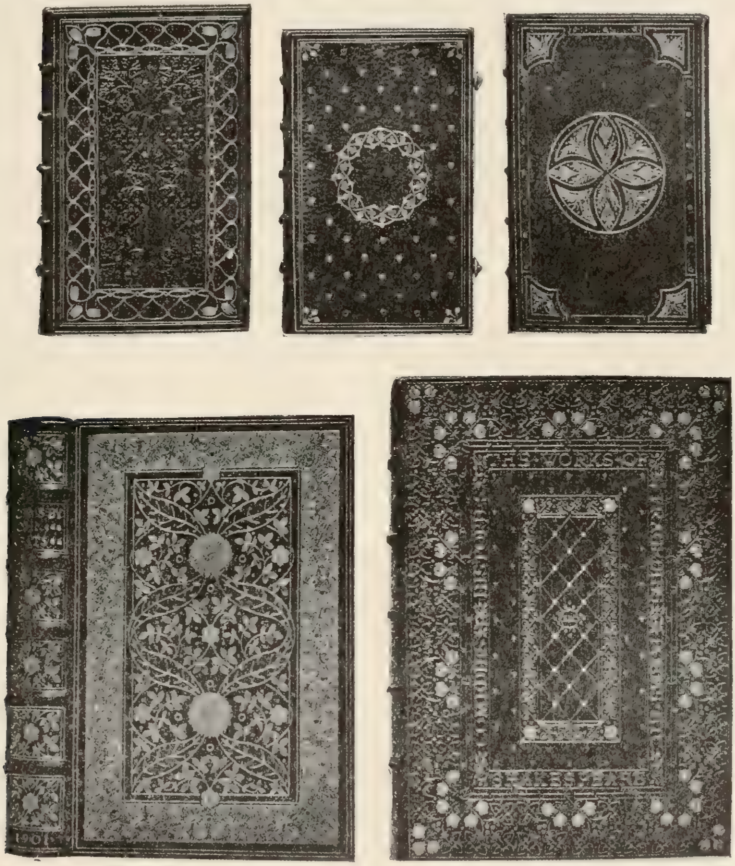
JAMES PARTON HANEY.

AT Paris in the summer of 1900 a handful of art teachers organized an "International society for the development of drawing and art teaching." This met at Berne four years later some few scores strong and there adjourned to hold its third meeting at London from August 3rd to 8th of the present year.

Viewed in the brief perspective of a dozen weeks the most impressive thing about this meeting was its professional spirit. It showed the art teachers of nearly forty countries roused to the point of international coöperation. Those used to the congresses of scientific societies would have missed the familiar papers on experiments tried and results achieved. They would have missed too the active discussions and the easy debate of practiced speakers. In place of these they would have found a nascent professional pride, eager to acquit itself well and anxious to strengthen every bond making for professional unity. The meeting was emphatically a success, withal it was one of workers unused to the machinery of an international assembly and experimenting in various ways to see how such a gathering might best be held. Some two thousand members were registered and thirty-seven countries were represented in the exhibit of work hung in the halls of the South Kensington Museum.

To the English committee the success of the gathering was in large measure due. Grappling with the countless obstructions and red tape which such affairs must always encounter, this body smilingly surmounted every obstacle and opened the doors of the exhibition halls on the day of the first meeting, with the exhibition completely hung and the addresses of an extended program printed and ready for distribution. In addition this committee forwarded to all members some weeks before the meeting, abstracts of the papers in English, French and German and arranged for the delegates, receptions, dinners and a dozen excursions to points of interest. To Sir John Gorst, chairman of the British committee, to the Earl of Carlisle, vice chairman, the Hon. Secretary, Miss E. M. Spiller, the organizing secretary Mr. C. Myles Mathews, the director of the Royal College of Art, Mr. Augustus Spencer, and a score or more of their indefatigable associates, the entire profession owes a debt of gratitude.

Some two hundred and fifty American teachers were present. These represented nearly two hundred cities throughout the United States and presented through their representatives, Messrs. Hall, Woodward and



BOOKBINDING—LONDON COUNTY COUNCIL ART AND CRAFT SCHOOLS.

Carter, a composite showing of our elementary schools and an exhibit from a number of secondary schools, colleges and schools of industrial and fine art. A distinguished courtesy was paid to the American guests. To them was offered the first hall of the many filled by the exhibition. This with some twenty other large rooms, and a half-dozen corridors was hung with a showing of drawing and design such as the world has not before seen. At the great "international fairs" there have been

before this fine collections of drawings and designs, but not before has there been shown the work of American and Continental schools arranged side by side so that immediate and critical comparison could be made. In addition to the Congress exhibition there was shown in the galleries the results of the National British competition in Art, held annually by the Board of Education, together with a retrospective exhibition of prize work from similar competitions for the past ten years.

THE CONGRESS SESSIONS.

The sessions of the Congress were held in the great hall of the London University. This vast and echoing room was all too large for the five hundred to one thousand delegates who daily assembled at the meetings, and the half dozen or more speakers who each morning read their brief papers found it difficult to make their voices carry through its broad extent. Forty-five names appeared upon the official program, but additional addresses were interpolated, so that in all over fifty papers were read at the meeting. Opportunity was thus given to hear and see the chosen speakers of a dozen nations, the United States being represented by Mr. Dow, Mr. Bailey and Mr. Miller, by Miss Langley and the writer.

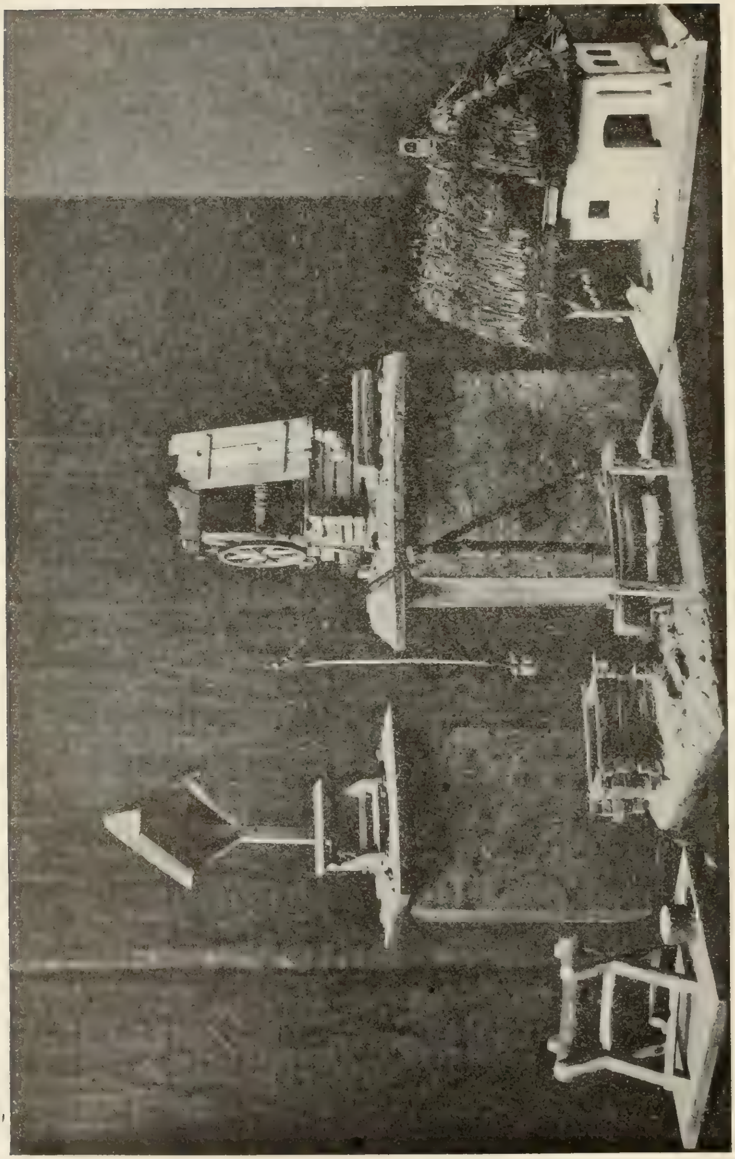
The program comprised general discussions on the educational value of drawing and on methods of teaching in schools of various grades. Some special topics also dealt with particular phases of instruction, with apprenticeship courses, and with art as applied to industry. As a whole the papers dwelt upon the broader aspects of each topic, and lacked something in specific reference to detailed methods. Each was furnished to the audience in printed form and in the language of the speaker (English, French or German) before it was read. This served to aid the indifferent acoustics of the hall, but also led inevitably to greater attention to the printed page, than to the person addressing the audience. From so large a number of addresses and from so varied a list of topics it is a bit difficult to draw general conclusions. The following however is offered as an impression gained from the papers and from the exhibits hung in the neighboring halls.

The aim of art teaching in the continental schools is not general but specific. Art knowledge is regarded as an international asset, and the industrial application of the study is kept continually in view throughout its teachings in the elementary schools. Thus the cultural value of the study is made subordinate to its industrial value. The

training given is "in" art rather than "through" art. In this there exists the greatest point of contrast with our own instruction. Our elementary teaching seeks as a whole to cultivate appreciation rather than technique. Continental teaching aims rather to teach the pupil to draw.

LINOLEUM BLOCK PRINTS. BOYS' SECONDARY SCHOOL, CHARLOTTENBURG, GERMANY.

Europe views the most elementary art teaching as work for the specialist. America looks continually toward training the grade teacher to teach under guidance of a supervisor. America recognizes her supervisors in both elementary and secondary schools, as entirely on a par with other teachers. Abroad the professional standing of the art teacher appears more in question, and reiterated demand was made in the papers of



MODELS FOR OBJECT DRAWING—HUNGARIAN SCHOOLS.

British and continental delegates for a higher standard of professional recognition.

Viewing their work as a specialty the papers of most of the speakers dealt little with the arts in the elementary schools, while the training of the grade teacher, a subject of much moment with us, was practically ignored. For the same reason the teaching of art as an integral part of the elementary curriculum appeared in few papers save those of the American delegates. Except also the addresses of the Germans, there was curiously little evidence that the modern scientific study of children was known to those who spoke on the teaching of drawing in the primary school.

DISCUSSIONS.

An attempt was made to discuss some of the many papers read, but these discussions could scarcely be called successful. The hall was far too big and the atmosphere far too formal, the papers too general and the time too short to permit satisfactory debate. It would have been better had the papers been completely printed and sent to the delegates before the Congress, and the general practice followed of discussing the views of the writer and giving him a chance to defend them.

The program was planned to present a number of papers reviewing similar topics. This of necessity involved many expositions of not dissimilar points of view. Had the papers divided among a wider range of topics, and had the speakers been confined to discussion these repetitions would have been obviated. Advantage would also have appeared had the writers dealt with specific details in aims and methods, with the ideals they held before them and the means they had devised to reach them. It is of interest to note in this connection that three of the American speakers used objective illustrations. In the case of all the other papers on the program, but one or two were presented with charts and drawings to aid the audience to comprehend the speaker's point of view.

THE EXHIBIT.

It was originally understood that the exhibit was in large measure to represent the work of the elementary schools. With the exception, however, of the British and American showing, the work of the younger children was confined to a few charts in each of the rooms given to continental countries. The remainder of the different exhibitions was made up of drawings from Industrial Art Schools.

The American elementary exhibition was a composite drawn from over sixty cities. It gave a very true impression of our average work. Free and vigorous in handling, seeking individuality in expression and interest in form, it was marked by our national shortcomings of indifferent technique, a certain straining for effect and a very uncertain drawing. The color work of the elementary pupils was good, while the applied design of the same grades compared very favorably with that shown by other exhibitors. The work as a whole was live; it was virile. It spoke plainly the pleasure the children had taken in its doing, and was frankly child-like. But a small quantity of all that had been gathered was hung, the remainder being placed in large cases in the aisles. Around these there was always to be found a group of foreign teachers' anxious to see in detail the method of approach used in our schools.

The elementary work from Great Britain did not differ greatly from our own, but in the admirably arranged exhibitions of Germany, Hungary, Austria, Denmark and Switzerland there appeared quite plainly the difference in our aims and those of continental teachers. For the most part these exhibitions of elementary work showed a limited number of carefully selected drawings. These illustrated the ideals of the best continental schools. In all this work from the tenth year there appeared marked emphasis upon accurate drawing and on technical finish. That which we know as "nature work" was absent, but in its place were excellent drawings of familiar objects, feathers, butterflies, stuffed birds and animals. These were nearly always in color, sometimes over charcoal; as a whole, quite flat and with a decorative feeling throughout. The drawings from the round were marked by excellent construction. They were as a rule much larger than our own, and showed a precision of handling foreign to our work. The examples shown by the City of Copenhagen remain in memory as remarkable illustrations of what pupils of fourteen can be led to do in the way of sound drawing, and sober color. It is interesting to note that the Hungarian exhibit showed a number of models used in the secondary schools: small thatched cottages, wayside shrines, well tops, sheds, doorways, and the like. These offered a suggestion to manual training teachers anxious to develop new forms useful in school work.

Little in the way of applied design appeared in the lower grades and that little for the most part precise in handling, but stiff and formal, done for practice rather than for actual application. Certain of the German cities, however, contributed decorative forms—wooden plates,

OBJECT DRAWING—PUPILS 13-14 YEARS OF AGE. COPENHAGEN, DENMARK.

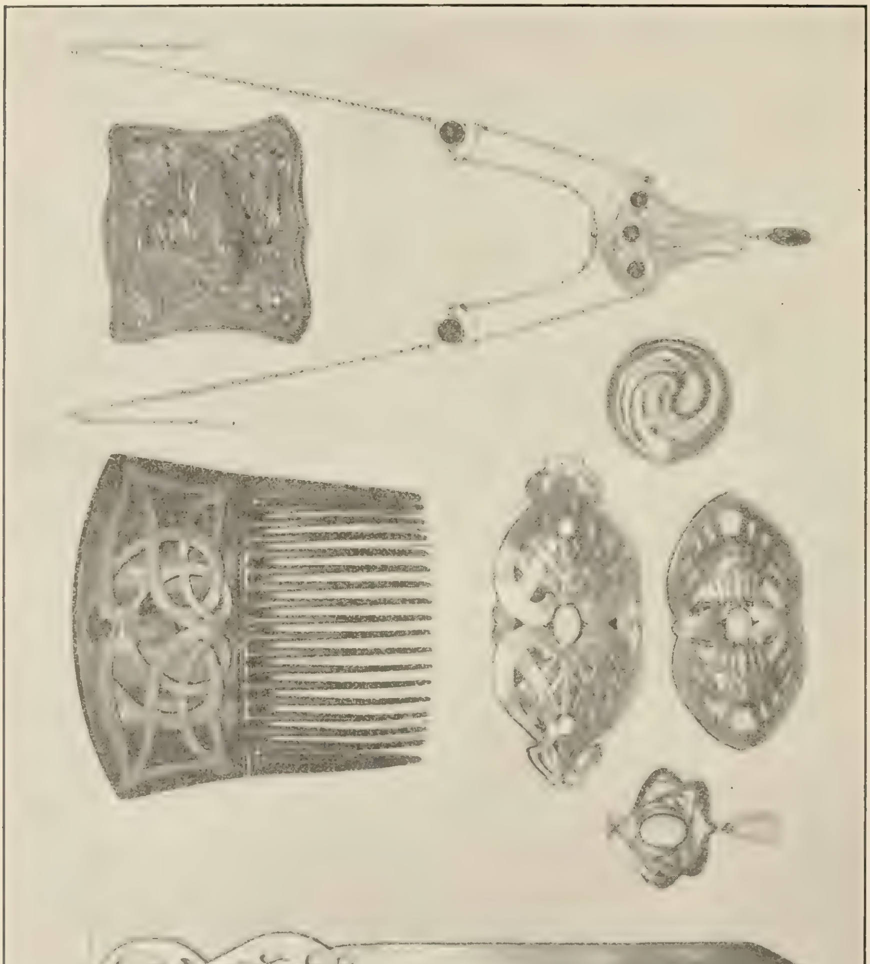
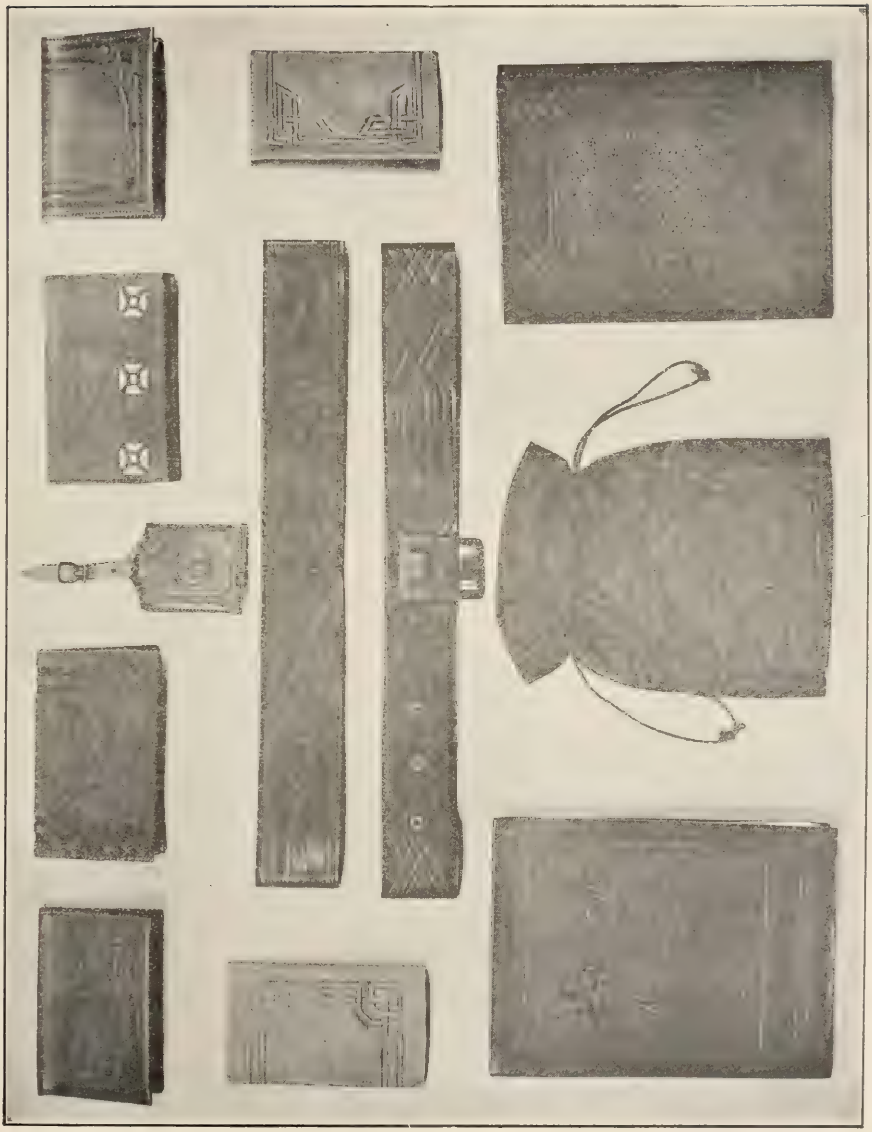


ILLUSTRATION FROM BOOK, "ART EDUCATION IN THE PUBLIC SCHOOLS OF THE UNITED STATES," PREPARED BY AMERICAN COMMITTEE. JEWELRY, RHODE ISLAND SCHOOL OF DESIGN, PROVIDENCE, R. I.



TYPE CHART FROM AMERICAN EXHIBIT OF APPLIED DESIGN. WORK OF CRAFT CLASSES, ELEMENTARY SCHOOLS, NEW YORK CITY.

boxes, needle cases—all with patterns worked out in brilliant colors. With these there was also shown some capital block printing done of "blocks" made of linoleum instead of wood.

HAND BOOKS.

With some of the exhibitions appeared brief pamphlets describing the curricula of important schools, Switzerland presenting in addition a brief review of the general organization of drawing in her schools. As a whole the exhibition lacked in explanatory matter of this description, some of the more hastily arranged exhibits not even bearing the age and grade of the pupils or the name of the city from whence the work came. The American section, on the contrary, presented a very complete statement of the scope of the art teaching done in our public schools. This formed a volume of some 400 pages supplemented by several score of illustrations. It was formally presented to the Congress by the Chairman of the Committee, Mr. James Hall, and was received with interest by the many foreign delegates anxious to inform themselves as to the aims of American teachers and the methods employed to achieve them.[1]

INDUSTRIAL ART SCHOOL EXHIBIT.

The American showing of industrial art work, presented in separate units the product of a number of our leading schools. It was well hung and elicited much favorable comment. With it there was shown a case or two of applied arts from different high schools, and a number of choice models of pottery from the school of ceramics at Tulane university. As a whole, however, we could not show work in the crafts comparable with the admirable exhibits of Austria and Switzerland, England and Hungary, wherein was presented a great variety of work in jewelry, bronze, bookbinding, inlay, textiles, metal chasing and printing. In addition to this work the continental countries offered a remarkable collection of drawings made by professional students of design. The sheets thus exhibited by the Industrial School of Zurich may be said to have formed the *clou* of the whole exhibition. Done on various tones of dark paper in light colored chalk these studies of birds, flowers and animals were fascinating in the technical knowledge they showed and the ease and beauty of their handling.

[1] See Book Reviews of the volume "Art Teaching in the Public Schools of the United States."—*Editor.*

For Americans the exhibition offered its greatest suggestiveness in the work of these industrial art schools. The variety and technical finish of the work was illuminating and the scope of its development formed an impressive lesson to teachers coming from cities which cannot point to a single art school. From city after city in Great Britain there was offered work done in municipal art centers. The extent of this industrial art teaching may be shown in some measure by the mere recitation of the schools which in London alone aided to fill the great hall wherein was exhibited the work of that city. A list of these schools "under councils" follows: The Shoreditch and the Paddington Technical Day School for Girls, the Shoreditch Technical Day School for Boys, The Lavender Hill Art Center, Putney School of Art, Hammersmith School of Art, Central School of Arts and Crafts, Westminster School of Art, Camberwell School of Arts and Crafts, Clapham School of Art, and the Camden School of Art. The work shown from these schools included excellent furniture, bookbinding, embroidery, printing, metalwork and jewelry.

The retrospective exhibition of the Board of Education has already been referred to. This, though not properly a part of the Congress exhibit had been arranged by the Board of Education, that the Congress delegates might see the result of the National Annual Competition. It showed the prize work of the present year with scores of designs, many of them developed in material, and many prize drawings and plastic models for the last ten years.. These drawings came from schools fostered thruout Great Britain by the national government, which since the International Exhibition of 1852 has striven to raise standards of industrial art training throughout the kingdom. The national system finds its center in the Royal College of Art in South Kensington and seeks through its annual competition and various scholarships to develop to the highest degree those students who are found to be possessed of talent. To describe the elaborate scheme of the annual competition is here impossible, but teachers anxious to become familiar with it, will find in the volume issued each year after the competition not only the problems and the names of the prize winners, but the commentaries of the distinguished artists who form the examining committees, and scores of illustrations which in themselves form a most instructive retrospective exhibition. These volumes may be procured from South Kensington for a few shillings each.

CONCLUSIONS.

The Congress as a whole served as a striking object lesson. As a professional achievement it marks a distinct epoch. Overshadowing in its size and importance the two earlier meetings, it may be counted the first real International Congress, and as evidence of the force of the movements behind its birth, it lends to the professional standing of every teacher of arts the world over. It should be felt an honor to belong to a body public spirited enough to hold such a meeting and possessed of men and women with the organizing ability to make it a success.

It would be of distinct advantage if provision could be made at future meetings to forward the different exhibitions to other centers after the congress itself had adjourned. Something of this kind has been done in the present case, the exhibition of the American section as a whole having been sent to Paris. Were it possible to bring to America, even part of the retrospective exhibition at South Kensington or the fine Swiss, Danish, Hungarian or Austrian showing, many valuable lessons would be learned by our teachers and by the public, both professional and lay.

A COURSE OF STUDY IN MANUAL TRAINING.—V.[1]

CHESHIRE LOWTON BOONE.

IT is a temptation to include in this chapter some information about modeling other than pottery. All clay work seems to belong in one group; but critical examination quickly gives modeling (of fruits, leaves, ornaments, etc.) a place with drawing, as a means of representing objects and things in the round. Modeling pure and simple is extremely valuable in the early years when conceptions of form and size are rather hazy, and repreesentations in three dimensions are a splendid addition to sand table groupings. Clay figures of people and animals are very realistic. The present chapter will however deal with ceramics only, since this is a course in handwork.

Clay is seemingly an ideal substance for school use so far as possibilities are concerned. It may be used to represent things, as may the crayon or brush, and it may be used to build real objects, taking readily the bold, emphatic, characteristic decoration which by its directness appeals to children. Pottery making offers the manual exercise and artistic problems needed in the intermediate gardes. Up to this time[2] pupils have been concerned with a more or less untrammeled expression and with the rudiments of measurements and construction in paper and cardboard. It is now time (fourth or fifth year) to introduce constructive work of greater range and difficulty, and to offer for the first time real problems in design.

CHOICE OF EXERCISES.

It is the purpose of pottery teaching not to develop a craft, nor primarily skill, but to present for the first time in school life a complete view and knowledge of some one industry (ceramics) and to call attention to artistic excellence as something to be desired: in other words to develop a high order of industrial sense and this involves design. The objects to be modeled should have in *every* case a real use, and that use should be in mind to the last. They should be familiar objects, and usually admit of a bit of decoration or decorative treatment. The following list will be suggestive:

[2] See previous numbers of MANUAL TRAINING MAGAZINE.

Tiles (square, round, oblong, triangular) for flower pots, teapots. Square tiles of various weights for paper weights. Incised, inlaid and modeled decoration.

Shallow saucers and trays.

Bowls: These if well modeled are an addition to the tea or dining table. Incised or modeled decoration.

Ash trays: match holders.

Ink wells, which may have space provided for pens.

Flower pots: These furnish one of the best of problems in fine proportions and reserved decorative treatment. Incised and modeled decoration.

Receptacles for flowers; the vase should be designed for characteristic kinds of flowers—those with long or short stems. Incised or modeled decoration, suitable color.

Fern boxes: these are usually square but may be oblong like a miniature window box. Each of the four sides offers a most tempting space for decoration.

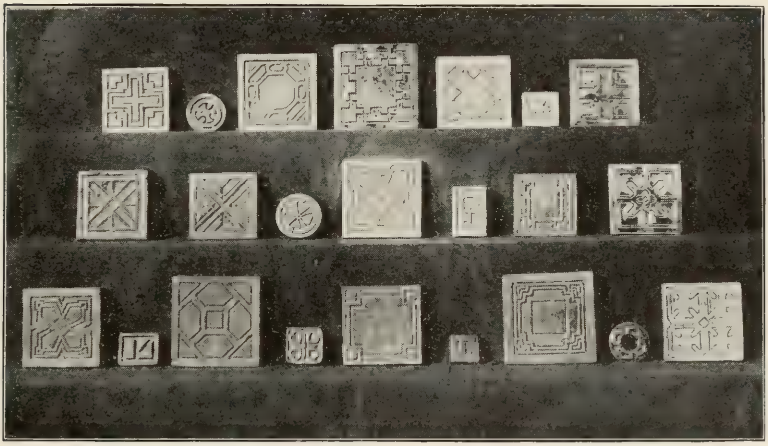
Jars with covers, for crackers, candies, tea, tobacco, etc. These are fine technical problems representing the greatest development of fourth or fifth grade work. The design problem here is simple and definite.

The above exercises aggregate more than any class can do in one year but they represent work which has been tested in the fourth and fifth grades. Just here it may be well to say that what is commonly termed primitive pottery is of no great value; it is but an historic item. There is no reason why pupils now should not make modern pots and make them in a modern way with all the perfection of finish and design that conditions allow. Primitive forms and primitive decoration are usually crude of necessity. That crudenesss need not be imitated.

PROCESSES.

The teaching is begun in the following way, using about the sequence given above. Pupils are instructed in the handling of clay and in the manner of making good tiles that will not crack or warp. Tiles are built most easily on common school slates. The size of tile having been determined, a thin layer of clay is built with small pieces, *well worked together,* making a foundation somewhat larger than the required size. On this foundation other small bits of clay (as large as a

marble or walnut) are thoroly worked until the tile is ¾ inch thick, homogeneous and perfectly smooth and level. The edges can then be cut straight and the corners square with a thin-bladed wooden or wire-end modeling tool. One tool with a wire loop at one end is sufficient for every pottery purpose in the intermediate grades.[1] This tile is the foundation for all other pottery problems. It is the first thing made, serving as the bottom for jars, flower pots and boxes.



NORMAL SCHOOL WORK.

Bowls, trays and other vessels are usually built by the method still used by the Indians: it is the practice which has been followed by most primitive peoples and can be made to produce very perfect ware. The process is illustrated in Plate I. A lump of clay is rolled into a thick rope, ½ inch in diameter. This is coiled to form the bottom, and the coils well worked together on one side, the whole turned over and the opposite side treated in a similar manner.[2] Additional rolls are laid around the edge of the foundation, on the tile, making the wall of the pot. When the wall has been built up three or four layers these should be worked together both inside and out to make the wall solid and firm (Plate I); each layer must be securely fastened to the one below, otherise the vessel will crack in firing.

[1] Such tool can be purchased of any art dealer.

[2] For bowl, etc., this foundation is best started on a piece of heavy wrapping paper which may however rest on the slate. The paper prevents the clay touching the slate and sticking, and allows the work to be turned about easily.

This practice of using rolls of clay produces pottery rather quickly and enables the pupil to soon learn to control the shape of the piece. To make the pot grow larger in diameter as it grows up, each successive layer is laid a bit toward the outer edge of the rim: to contract the top, the successive rings of clay are attached to the inner edge of the

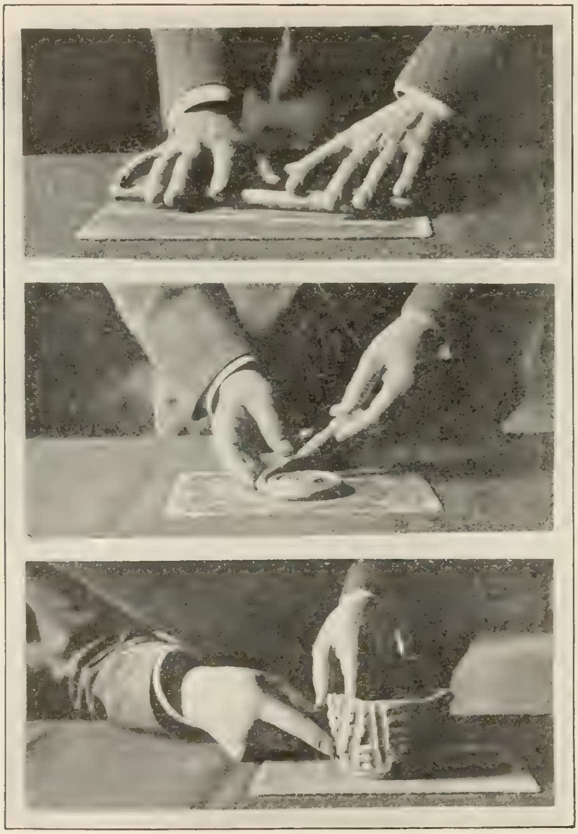


PLATE I.[1]

roll beneath. To be successful the rolls should be made with the fewest possible manipulations, as clay tends to dry and crumble with much handling. It is not necessary to use sponge and water to keep the clay moist but it is essential that the clay shall, in the first place, be in perfect condition for use. As it can be purchased, rightly prepared, from

[1] By courtesy of *The School Arts Book.*

most potteries, it is easily kept in condition in any heavy box if covered with plenty of wet cloth. The use of water during the lesson is unnecessary.

This primitive process is quite as satisfactory for rectangular things, only care must be used to keep corners square and the sides straight.

Pottery, even built ware, should be as thin as possible. As pupils gain skill their building ought to be more true and they should make lighter pieces. All pieces made in this way must be scraped down smooth on the outisde, and this process can be carried on until the walls of the pot are quite thin. The scraping (with the tool mentioned) should be done if possible after the work has stood a day or two and become somewhat stiffened, so that handling will not put it out of plumb. This finishing process is the real test. The form may have had, roughly, the shape desired already, but now the vessel must be made symmetrical, with level top and bottom. Sometimes a templet, cut in the shape of one side of the vessel, is used to test the work, but young children do not profit much by such devices: symmetry thru judgment is the main thing.

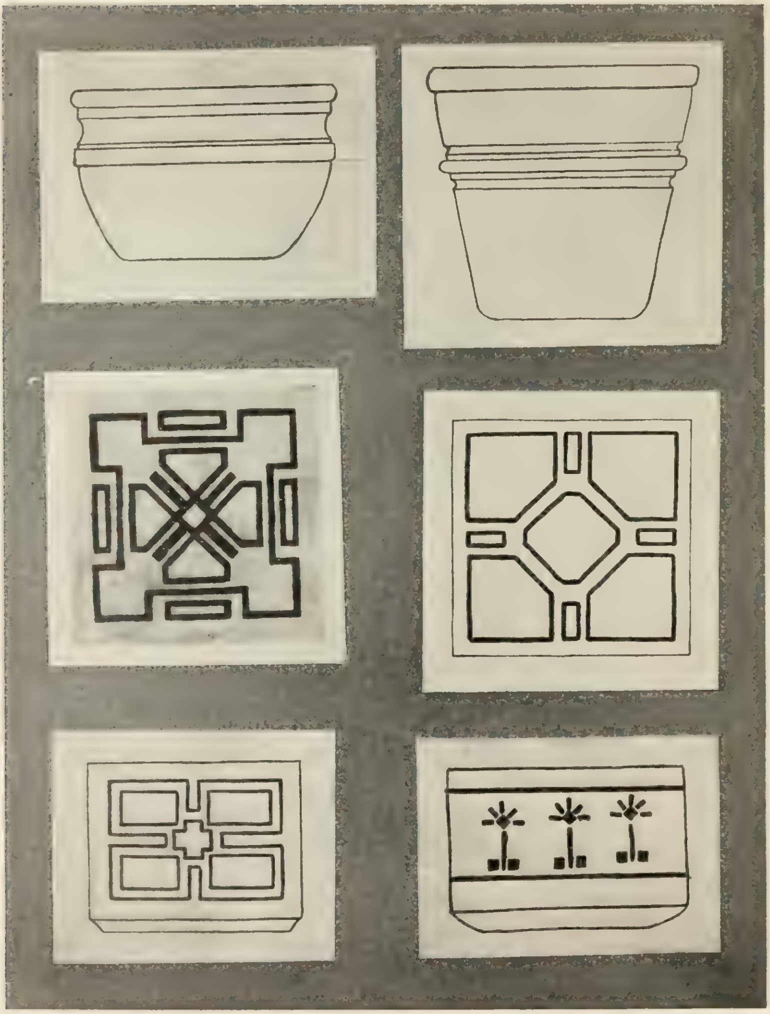
DECORATION.

Ornament should keep its proper place as a part of the whole design. The application of ornament should be consistent with the material of the object decorated. Clay pieces may be embellished by motifs scratched in the soft material, or modeled in relief, or even painted on, if the painting be done in color that will stand fire. The most direct ornament is that incised in the clay itself and this kind is the backbone of design for pottery decoration.

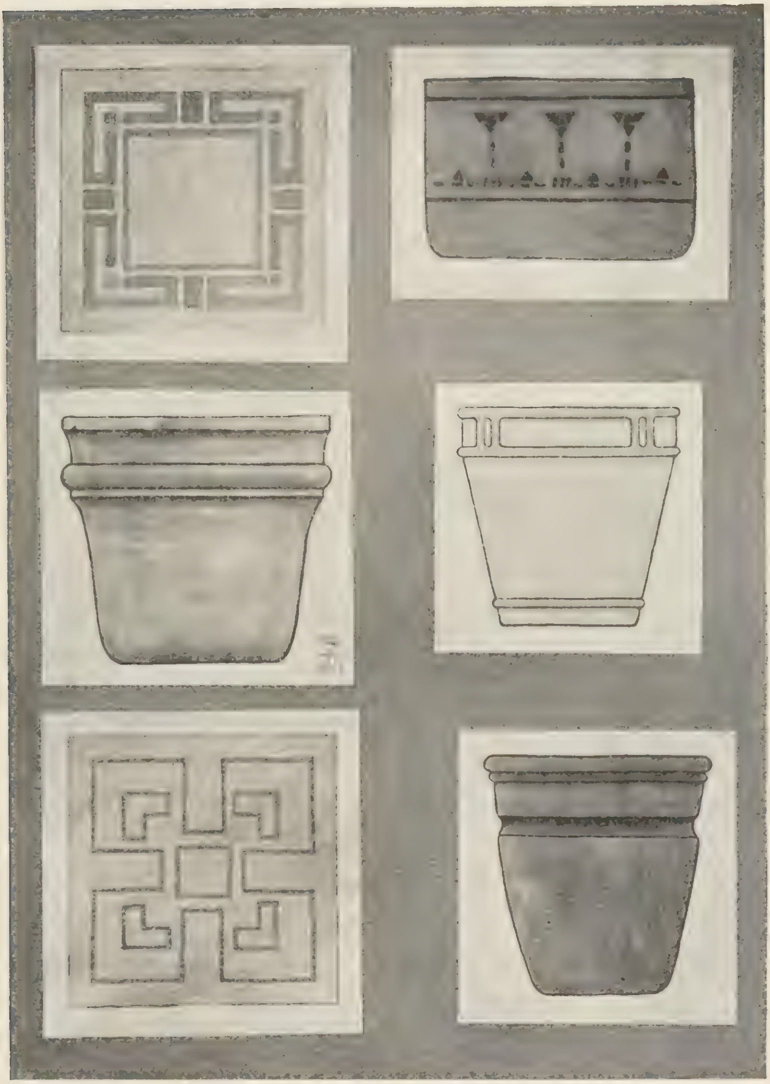
The design can be produced by means of a stick with one end shaped like chisel and as wide as the proposed line. These lines should always be rather wide and deep so the design cannot be obliterated by the glaze to be applied later. Other sticks are easily cut with ends that are round, square, oblong, triangular, etc. These tools are used as stamps to impress in the clay depressions of the same depth as the lines used to form the body of the decoration. Combinations of lines and dots make effective designs and their execution is easy and rapid. Plates II and III.

APPLICATION OF DECORATION.

Decoration, for the first two or three pieces, should be dictated by the teacher, that pupils may have the opportunity to learn the tech-



DESIGNS MADE BY PUPILS IN THE INTERMEDIATE GRADES, MONTCLAIR, N. J.



DESIGNS MADE BY PUPILS IN THE INTERMEDIATE GRADES, MONTCLAIR, N. J.

nique of pottery making, and become familiar with the peculiarities of the material. The first tile having been completed, the proposed design for it should be drawn on the blackboard or a large sheet of paper, indicating just where the decoration is to be on placed on the

CLAY POTS MADE FOR GERMINATION EXPERIMENTS.
GRADE IV. MONTCLAIR, N. J.

tile. Pupils should be instructed to keep the decoration at least ½ inch from the edge on ordinary tiles (6 inch to 8 inch). The design should be lightly indicated in the soft clay with a pencil or sharp stick, without rule or measurement other than what can be accomplished with the tool ordinarily used. The lines should then be cut deeper and with sharp edges with the chisel shaped stick. This must be held at right angles to the tile, presenting the *straight* side toward the clay to be removed. Dots and smaller parts of the design can be stamped into the clay with the other tools described above.

Dictated designs may be given for several problems before asking the class to attempt original work. Decoration may be applied in still

other ways, two of which are useful and interesting. Some objects, like the flower pot, need emphasis at the rim for structural reasons. This may be secured by making the rim thicker, when it becomes a band or moulding around the top. This band can well be repeated in lighter form elsewhere on the piece. It is put on as a strip of damp clay after the pot is nearly completed. Such modeled motifs are often modified to make more intricate patterns as interlaced or strap work designs or are supported by incised spaces near by.

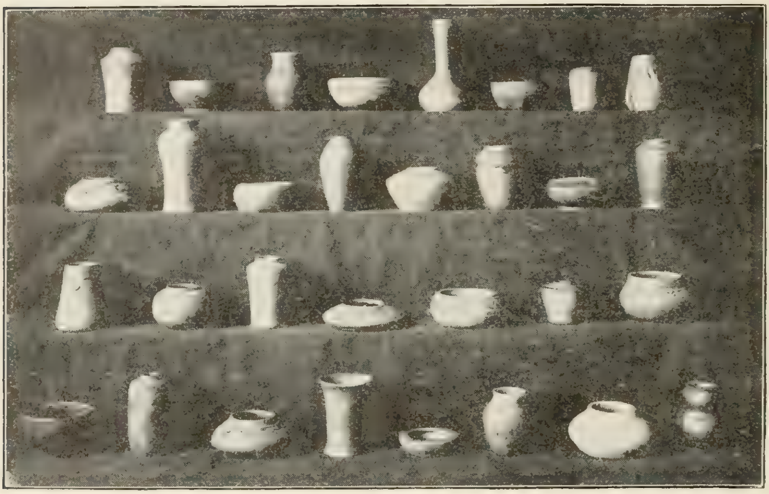
The last method is known as slip painting. Clay mixed with water until it has the consistency of cream is called slip. To this may be added underglaze color or metallic oxides[1], to give various tones when burned. The slip should be free from lumps and grit (it can be put thru a fine sieve) and thin enough to be applied with a brush *while still damp* or rather hard as it is called. The design having been indicated lightly with a sharp point the slip is applied with a brush. The design may be gone over several times, giving the decoration some perceptible relief above the surface of the vessel. Slip decoration is full of possibilities. It enables the pupil to not only produce decoration in relief but in color. Decoration may be incised and the depression filled with colored slip which in this case should be as thick as possible to eliminate some of the shrinkage.

KIND OF DECORATION.

The special kind of ornament most suitable for clay has already been suggested indirectly in the description of tools. The first attempt should be with straight lines for incised work on a square tile. Two general types of decoration are possible, the border and the subdivided rectangle or area. The simplest border is a straight line or lines. This may be varied in width, or broken for the sake of interest, or strengthened at the corners. Dots or other accents may be introduced if properly massed or placed so as to preserve the form of the design as a whole. The border, whether on a tile or other bit of handicraft, is for the specific purpose of limiting and defining the area and emphasizing its shape. The second type of design is the subdivided rectangle or space into several smaller spaces in proper relation as to size and shape. In attacking this problem with children, the teacher must have a care in stating the requirements. The design must be symmetrical about

[1] 1 to 10 per cent of color.

the center of the tile. It is well to indicate a definite central area as the square, circle, cross, etc., and show how other spaces may be made to fit around it and preserve the shape of the decorated surface. Such decoration often follows the construction and form of the rosette.[1]



NORMAL SCHOOL WORK.

BURNING THE BISCUIT.

Finished pieces with completed decoration are usually burned before applying any glaze. For this first burning the ware may be placed in the kiln oven, as closely packed as space permits, with the obvious provision that too much weight is not put upon light, thin articles as trays, tiles, etc. Tiles should be laid flat, half a dozen or so being piled together so they will not warp. Tiles stood on edge or leaning against other pieces of ware, do not preserve their flatness. The burned ware before the application of glaze is called biscuit.

[1] Rosette patterns are often devised by cutting tentative designs from folded paper squares. The results are interesting, surprising, sometimes good and the device is valuable for teaching radiation and symmetry. But this is not designing and as soon as the proper conception of the kind of decoration is fixed, subsequent patterns should be really constructed or composed for the space relations, that are satisfactory. For method of cutting paper rosettes see School Arts Book for June, 1906.

The most satisfactory kind of kiln for burning pottery is the portable type using kerosene for fuel. The only two at present on the market which are satisfactory are those manufactured by H. J. Caulkins Co., 24 Gratiot Ave., Detroit, and Henry B. Lewis, 45-47 Joseph Campau Ave., Detroit. These kilns are not cheap but they do the work at small cost when once installed. The firing of a kiln with oven 20x18x36 inches takes but six hours. These portable kilns are furnished with fire clay shelves and supports so that the oven space can be all used.

The firing must be carried on until a definite temperature is reached, which changes the clay into a fixed substance, the biscuit, which will not then become soft and plastic again. This temperature is indicated by small pyramids of special chemical composition whose melting point is known. The cones are numbered from 010-09-08, etc., to 01-02-03, etc. The first, 010, is softest and when the proper temperature is reached, the cone softens and gradually curls over, ultimately melting down into a soft lump. Most common ware should be burned to at least the melting of cone 06 or 05. The temperatures for proper development of glazes, to be given later, will be a bit higher, cone 04. The cones are set in a lump of fire clay, using two or three softer than the desired temperature, and one harder; this is the order 06-05-04-03. The set of cones is placed in the oven exactly opposite the peep hole, where the development of heat in the oven can be watched. Generally the burning of biscuit is not a difficult or trying operation, but one seldom burns a kiln of biscuit alone. Usually the kiln is made up of glaze and biscuit, and burning the glaze is a process demanding much care, as wil be seen later on.[1]

[1] Glaze making and glazing, burning the glazes and the cost and equipment for pottery work will be dealt with in the next paper.

A SCHOOL PRINT SHOP.

A SCHOOL PRINT SHOP.

LEONARD W. WAHLSTROM.

THE last few years have seen a vast broadening of our outlook toward the manual arts in their relation to school work. It is but as yesterday that the work bench was the only avenue of manual activity which reflected the industry of the outside world within the school. Even this was looked upon with small favor and the time devoted to woodwork begrudgingly given. Now that the value of education through activity is more fully realized we see other forms introduced—a renewed interest in clay and its possibilities, metalwork in its various forms, the textile arts and other industries of more or less prominence. Among these, none, it seems to me, gives promise of greater possibilities than does printing.

Handwork first came into the schools as a reaction against the inactive, sluggish and academic methods which have been the heritage of schools since the middle ages. Passing through the purely "physical activity" stage it has now reached the point where it is urged that handwork interprets the field of industry, that it be fraught with greater content value than in the past; that this content may even be of such value as to place the manual arts on a par with the traditional subjects of the curriculum.

Thus we have come to look upon handwork as interpreting within the school, the industrial world outside, and the woodwork, the metalwork, pottery, textiles, etc., take on a new significance. The pupils view the everyday activities round about them with greater intelligence and keener insight. And all this in addition to the educational values formerly urged—namely, a renewed interest in, and motive for, the conventional and, to the boy, often prosaic studies of the schoolroom, which the handwork assisted in developing.

Viewed from this standpoint, what industry touches the life of the school more vitally, and for that matter, society at large, than does the printing art? Why then should not the printing press have a prominent place among the activities of the school?

It has been claimed that the printing press brought political emancipation to the mass of mankind as well as intellectual emancipation. It is essentially a democratic art. It does not lend itself readily to the selfish uses of the few. Knowledge formerly in the hands of the few became the property of the many with the advent of printing. Its development has been parallel with the development of humanity, whose servant it has ever been.

This quality is one which recommends it especially for use in the school. The average schoool is organized on an individualistic basis. Pupils are there for selfish motives—to gain knowledge. Social service in the ordinary schoolroom is so seldom met with because no opportunity is afforded to practice it. At times the spirit of social service creeps into some of our school subjects in a spasmodic way and then shamefacedly retires, and the old selfish, individual spirit reappears.

We find this the case in our woodworking shop, when the occasional group project is worked out for the school, and then the relapse to the individual model. On this side, then, of providing opportunity for social service, the value of printing as a form of manual activity is noteworthy. A boy may go to the workbench to do a piece of work. This is usually for selfish motives. Seldom more than one piece is made. On the other hand it is hard to conceive of type set up for one impression; it is seldom done. Printing presupposes many copies to benefit many individuals.

Take an inventory of the things a boy could print and enjoy selfishly, all his own, and they would be few indeed. I confess I have tried and find the list very small. His personal card, letter head, book plate and a few others would probably cover the list. Now take a list of the

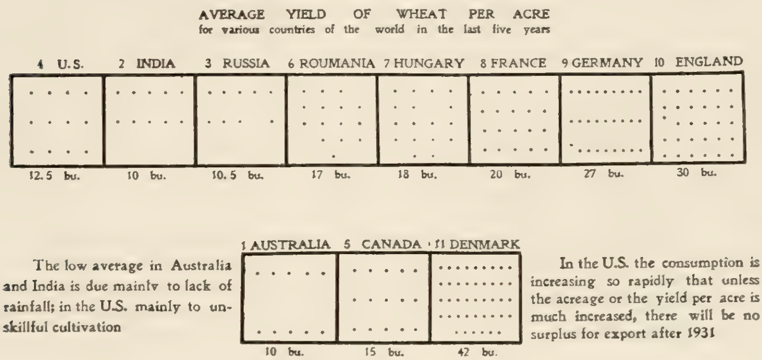
things he could enjoy with others and see the vast possibilities; motto cards, calendars, invitations to school parties, tickets to school entertainments, school paper. Again make a list of the things which are a daily necessity in the life of his community, *i. e.,* the school, and where does the list end? Report cards, blanks, spelling lists, arithmetic lessons, labels for shop, labels for library shelves, circular letters, etc., etc. Do you not think the boy is more a part of his community, more in sympathy with it through having served it? He is an important, valuable part of it. This feeling of responsibility, of value through service, I claim is an important lesson in citizenship. Compare the feelings of the boy who reflects that his job which he has set up and of which perhaps 500 or 1000 have been printed and sent out to as many homes carrying information of importance in his community; compare his feelings with those of the boy who receives a pat on the head when some piece of woodwork is brought home.

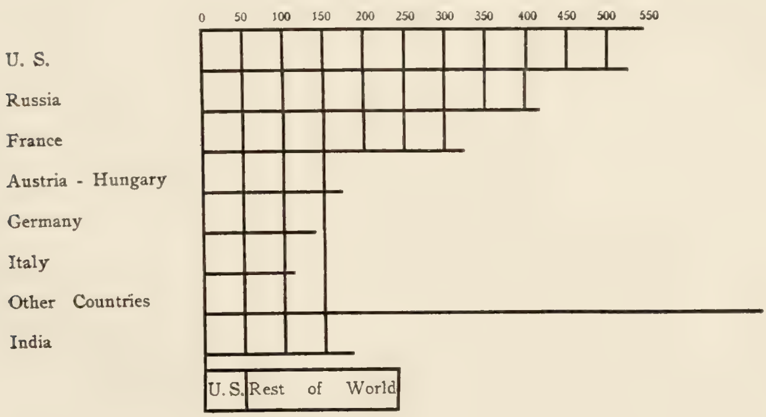
Just as printing makes its appeal to the boy on the side of social service, so it has its greatest claim to a place in the curriculum through the possibility of close contact with the other subjects. It would be imposible to conceive of any form of manual activity which could vitally touch all of the school subjects, interests and activities in such a way as printing would do many times during the year. The possibility of helping to unite the various school subjects, to interrelate them, and give them a vital, personal and local touch, rather than leaving them so many isolated subjects is a vital one.

To illustrate, the class in geography may gather data regarding local industries, these facts may be formulated and printed as a series of problems in arithmetic. Pupils may gather words met with in their daily life and these words may be printed as spelling lessons, thus building a spelling book each word of which is weighted with meaning not possible in the stereotyped spelling book. One lesson may be made of words met with in the shopwork, another lesson may be music terms, another from history, etc. Our school subjects in the past were fenced off one from the other and the child "turned out to grass," first in one and then in the other. We have been struggling to get over this. The introduction of printing as a manual art in the school will aid in unifying the subjects.

I have suggested above how geography, spelling and arithmetic may be benefitted by the printing. Perhaps no subject is so closely in touch with printing as English. Questions of form and punctuation, such as

indentation of paragraphs, use of commas, periods and semicolons are of great moment to a boy who is "setting up a job" which is to be actually used by 500 or more members of his school community. Greater indeed than when it is merely a question of a boy's carelessness, a teacher's





France	325,200,000 bu.
Russia	424,000,000 bu.
Germany	156,000,000 bu
Italy	116,000,000 bu

over-particularness and a stroke of red ink. Syllabification is also important. The dictionary is consulted more freely when the "justification" of a line of type is concerned, than when the balance of a word can be crowded on the margin of the composition paper.

Besides furnishing spelling lessons of a vital character as mentioned above, printing may help the poor speller through the act of setting

type. Poor spelling is often due to defective imagery. The poor speller is often a good motor type of individual. It is believed, and experience seems to justify the claim, that actually handling the type in composition, reading proof, etc., will lead to greater attention to details as regards spelling.

The impetus which may be given to written work, compositions, etc., by means of a school paper, printed and published by the pupils in the school building, is considerable. By this means the distinctly literary type of pupil and the motor or mechanical type may have a common meeting ground. This will aid in preventing a separation between these two classes of pupils, so noticeable in many schools. By means of editors, business managers, reporters, compositors, pressmen, etc., each type of pupil will find its field of interest.

Mathematics also comes in for its share of attention. The point system, on which all type are cast at present, is based on the inch. One point is one seventy-second of an inch. The printer's unit of measurement is the 12 point em. The relation of the various sizes of type to that unit, involves considerable work with fractions. The planning of tabular work involving the use of rules, requires considerable mathematics.

On the art side there are many points to consider. The first effort should be to show that every piece of printing is a work of art, good or bad, even though a page of solid type matter, depending on relation of type mass to page, margins, etc. Some little time should be spent on this side of the question before rule work, illustrations, zinc etchings, woodcuts, etc., are introduced. When a boy gets a sense of proper margins, relation of black to white on a page, then other elements may be introduced.

The use of wide margins on formal printing such as invitations, letters, etc., and the use of narrow margins on strictly business communications, such as reports, filing cards and blanks is an art question decided by use to which it is to be put. The selection of paper for a particular job is also a matter of art. Not alone color, but texture and weight are determined by use. Is it a piece of printing which is to be handled much and passed from hand to hand, or handled but little? Care must be taken to select color and texture which will not soil easily. Is it a blank which is to be carefully filled in with ink and filed, or a temporary blank, hastily filled in with pencil; this is another question of function, and when rightly considered, a question of art. On the one hand a blank may be printed on the cheapest of manila paper and yet

be an artistic piece of work, because it admirably fulfills its function; on the other hand it might be printed on a better quality and more expensive paper and at first glance proclaim its unfitness.

The relation of size of type, spacing of letters for effect, use of rules and florets are questions of art. The use of colored inks on colored paper, producing proper harmony of color schemes is also another printing art question.

P H O T O G R A P H Y

SEVERAL HIGH SCHOOL BOYS are prepared to take orders for photographic work. Developing and printing will be done at reasonable rates.

Leave films or plates with Mr. Hine with clear instruction as to number and kind of print desired.

O U R Y E A R B O O K

The bees are humming,
And Spring is coming.
Hooray! Hooray! Hooray!

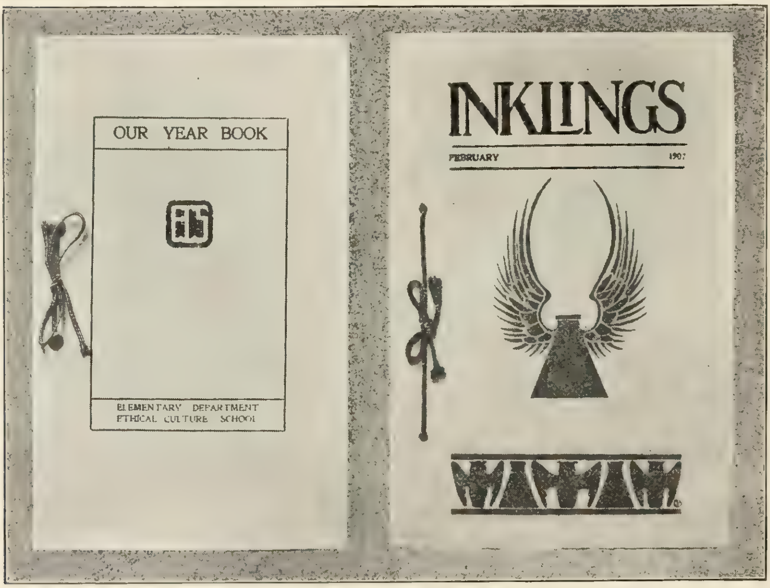
In the Springtime, Pussy Willow
Starts to wake upon her pillow;
And she is a pretty gray.
"Peep, peep, peep," the birdies say.

The crocus is growing,
And Winter is going.
Hooray! Hooray! Hooray!

Grade II

On the side of illustration and design there are the possibilities of the woodcut, zinc etching and chalk plate. From its historical association with the invention of printing, the woodcut is interesting. Satisfactory and usable work on the press is within the range of pupils, the design being cut in reverse. Side grain white-wood has answered the purpose well. Blocks may be ⅞ in. thick, which is a little less than type high, then built up to proper height on the press. The much abused pyrography sets have been quite useful in cutting or burning away the background after the design has been outlined with knife or veining tool. This eliminates considerable danger of accidental damage in chiseling. An interesting use of the woodcut has been the printing in bold lines of outline figures for color lessons in the primary grades. In this way peppers, turkeys, tulips, Santa Claus, etc., have been cut and printed as the season demanded, the children of the first and second grades taking great delight in filling in the outline in color.

In the zinc etching the design is painted (in reverse) on a sheet of polished photo-engravers' zinc, with asphaltum varnish; then the background is etched with sulphuric or nitric acid to a proper depth. The asphaltum is next removed and the plate blocked up to make it type high. Another method consists in covering the plate with paraffine and then scratching or cutting away the background before treating to the acid bath.



The chalk-plate process was a favorite mode of reproducing sketches before the cheapening of the photo-engraving process, and is still in use in some country newspaper offices for making cartoons. The chalk-plate consists of a steel base on which is a deposit of specially prepared chalk. The design is traced on this chalk, then scratched through to the base plate. Next the plate is clamped in a casting box and hot stereotype metal poured in, resulting in a casting of the design in relief. This method varies from the woodcut and zinc-etching in that the drawing need not be in reverse. Matrix paper may be used for taking impressions of standing type matter, and the matrix thus made treated much as the chalk plate in the casting box. For details as to chalk-plate

process and supplies consult the Hoke Engraving Plate Co., St. Louis.

Ink drawings may be sent to an engraver and zinc cuts made by photo process at reasonable prices. This method is recommended for such work as pupils cannot successfully carry out by methods mentioned above.

Thus far I have considered the social values of printing in the school. Now I wish to consider what may be called the psychology of

SHOP TALK

PUBLISHED OCCASIONALLY BY THE BOYS OF THE PRINTING CLASS OF THE ETHICAL CULTURE SCHOOL.

VOL. 1, NO. 1. FEBRUARY 1907.

INTRODUCTION

There is a need, as we know, for short articles on useful points about shopwork. To eliminate this need we, the boys of the printing class, have undertaken to print short talks upon the aforesaid points.

We also hope to give you a glimpse of the history and manufacture of some the most useful and yet most common tools in the shop.

Occasionally we hope to print special editions upon subjects concerning different classes such as waterwheels for grade 7 etc.

We hope to make our paper interesting as well useful. Hoping you will both enjoy and profit by our little paper we here put forth, the first number

He that can have patience, can have what he will.

Well done is better than well said.

Poor Richard.

SANDPAPER

Sandpaper is not usually considered one of the shop tools, but just as much attention to its proper use is necessary. It is not intended to take the place of tools. Many boys try to do with sandpaper what should be done with chisel or plane, and the result is very unsatisfactory.

The sand used in making sandpaper is crushed quartz, which has sharp edges. This is graded according to coarseness. The finest is 00; 0, 1, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, and 3 are the other sizes, 3 being the coarsest.

In using sandpaper the momotion should always be *with* the grain, never across. If used with the grain the small scratches left by the sandpaper do not show when the wood is stained or varnished.

In sandpapering flat surfaces the sandpaper should always be wrapped about a block. This prevents the corners of the work from being rounded.

printing. I can best do this in comparison with woodwork with which, no doubt, most of my readers are familiar.

The motor side of type composition is a matter of arrangement and adjustment of material (type, etc.) which is of a fixed size. This does not require the skill of hand which is necessary in guiding a chisel or a saw. It requires rather a deftness of fingers in manipulating the type. This takes patience, perhaps more than woodwork. Physical strength is not so necessary, while mental processes are as prominent, if not more so, than in woodwork. Because of this difference printing makes its appeal to a different type of boy from the woodwork. The boy who seems to spoil everything his hand touches at the bench, who seems to be all thumbs and never succeeds in finishing a job, curiously enough, gets along well in type composition. It seems to be just the kind of motor activity to fit his case. If such a boy is looked up in his other school

work he will often be found to stand high, especially in English and art.

In furnishing a means of manual expression to this type of boy, printing serves a valuable place. In several instances such boys after becoming utterly discouraged in their woodwork have been transferred to the printing class and have "found" themselves. They have taken a new lease on their shop life. The moral value to these boys in discovering an asset of productive worth in themselves, fully justifies the introduction of the printing work.

In presswork a certain ambidexterity and alertness is necessary. While the right hand is feeding the paper the left hand delivers the printed sheet. Then, too, the foot must come into play in working the treadle. This muscular coördination has proved valuable to a certain type of pupil and cannot help but have a stimulating effect upon the mind. When this coördination has been acquired and the boy is in tune with the machine it becomes habit. However there are plenty of things to think about to keep this from getting too automatic—the ink, impression, guide pins, everything requires an alert mind. Neatness is necessary in handling the clean paper amidst the oil of the machine and the ink on rollers and plate. A delicate touch in handling the paper without mussing is also required.

ORGANIZATION, METHODS AND EQUIPMENT.

It is not believed that printing as here suggested, is practicable below the eighth grade. It can well be carreid into and through the high school. If introduced as a part of the manual arts course it should be treated as a distinct industry or art craft, not as an adjunct to a course in woodwork. The methods, tools and practices of a real print shop should prevail as far as possible. A foot-power press, capable of a fair speed should be provided, not a wooden model worked out in the shop course. The Benjamin Franklin model is valuable historically but not practically.

Everything printed should be for use. The larger share of attention, especially at the beginning of the course, should be paid to composition of plain type matter, and distribution after a job is finished. Distribution is like washing dishes, a rather prosaic, but still very necessary part of the work. Woodcuts, zinc etchings and illustrations should not be forced, but allowed to work in naturally and incidentally. It is so easy to reach out for the more showy forms of work to the neglect of the fundamental.

If we establish the rule that our print shop is to fulfill social needs there will be no dearth of "jobs." Many things may be needed in such quantities as to tax the producing powers of our press in the regular shop period. To meet this demand, arrangement may be made for additional presswork, by having certain boys excused from study periods to run the press. There are many cases where a little expenditure of motor energy on the part of the boy in the middle of a long session of recitations and study periods will give the needed relaxation and change. It is not difficult to schedule boys for voluntary work after school hours. A system of "apprenticeship" has also been found to work well. This has consisted of placing a new boy in charge of an "old hand" on the press, when the latter has had a sufficient amount of experience, and making him reponsible for training the new man. Very often it may be advisable to arrange for Saturday work, paying for this work on the regular basis of apprenticeship wages. The opportunity to be socially productive is not provided in the school to a sufficient degree.

In the matter of equipment there is a great temptation to stock up on the thousand and one things so temptingly displayed in printers' catalogs. The following list, however, is considered, from a rather economical point of view. It is better to begin with a small equipment and add to it as the need arises. With the following equipment it has been possible to print a considerable number of blank forms and report cards for a school of 500 pupils, besides a school paper of some thirty pages, three or four times a year. The equipment here described, as well as illustrations of work, are from the Ethical Culture School, New York City.

1 foot power press, 8x12 inches, with throw-off and ink fount.
4 chases, 1 dozen pairs quoins, 1 quoin key.
1 imposing stone, 24x36 inches.
1 brass make-up galley, 8x12 inches, for each boy.
1 standard job stick for each boy.
1 bodkin for each boy.
1 Eureka lead rack.
1 rule case.
1 case labor saving metal furniture.
1 half case labor saving wood furniture.
1 planer.
1 mallet.
1 proof planer.
1 lead cutter.
1 back saw and bench hook.

50 pounds 10 point type.
25 pounds 8 point type.
10 pounds 6 point type.
2 fonts 18 point type.
10 pounds 12 point type.

This type should be of one series. It is best to decide on one series of type and confine purchases to this face with addition of one or two fonts of job or display type.

Assortment of cases (California job cases) to contain above material.

10 pounds 10 point leaders.
10 pounds 10 point quads.
10 pounds 8 point leaders.
10 pounds 8 point quads.
10 pounds 6 point leaders.
10 pounds 6 point quads.
10 pounds 12 point quads.
10 pounds 18 point quads.
2 fonts labor saving brass rule, 1 point.
2 fonts labor saving brass rule, 2 point.
50 pounds labor saving leads, 2 point.
25 pounds labor saving leads, 1 point.
1 Hercules staple binder, No. 6.
1 paper cutter, 22½ inch.

The paper cutter will soon save its cost in time, trouble and paper stock. It is also useful to other departments of the school. It makes possible the purchase of paper by the ream. Scraps may be trimmed up and glued up for scratch tablets for use in the school, thus opening up an allied industry and additional avenue for developing and utilizing productive value in the boys. Tablets and scratch pads may even be made wholesale for the school at considerable saving.

The staple binder is useful in binding pamphlets, school papers, compositions, reports, etc.

SUGGESTIVE OUTLINE FOR COURSE IN PRINTING.

Together with the practical work of the printing should be included talks on the history and development of printing and its relation to the progress of mankind. The following outline is prepared with this in view.

I. Talks on History of Printing.[1]

[1] These talks may be illustrated by means of pictures from various sources. See copies of excellent pictures in Library of Congress. Stereopticon slides would be valuable.

1. Early methods of transmitting knowledge.
   a. Word of mouth; minstrels; minnesingers.
   b. Stone cairns.
   c. Picture writing on stones and skins.
   d. Invention of alphabet and writing; scribes, books, parchment, wax tablets.
   e. Illuminated manuscripts; monks.

2. Discovery of movable type; Guttenberg; effect.
   a. Improvement in type making; lead.
   b. Improvement in press; Franklin.
   c. Modern methods; cylinder press; linotype.

II. Pratical shopwork.
   1. Names of material used in printing office: Type, leads, rules, stick, galley, furniture (lead and wood), chases, quoins, key, mallet and planer, press, cases, stand, lead cutter, etc.
      Practice in holding stick and in setting type properly.
      Set type from "pied" matter for practice in holding stick.
   2. The type case; lay of the cases, cap and lower.
      Type faces; prominent names.
      Point system; lining system described.
      Distribution of type set in previous lesson; proper method of holding; wetting; reason.

III. Excursion to a typical job office to see all the processes of printing in operation, especially noting workmen and their methods.

IV. Practical shopwork.[2]
   1. Simple composition; spelling lists.
      Margins; top, bottom and sides.
      Justification of lines.
      Removal of type from stick; tying up type.
      Removal from galley to stone.
      Correcting.

   2. Plain reading matter.
      Rules for spacing; indenting paragraphs.
      Space between words and at end of sentence.
      Size and style of type in relation to nature and use of job.
      Consideration of paper, size, quality.
      Margins; bottom, sides and top.
      Size of type mass in relation to shape of page.

English composition, reprints of lessons, school papers, etc., will furnish abundant material of this nature. A long job may be divided into paragraphs, each boy setting one or more paragraphs. This makes possible rapid work.

[2] Sufficient time should be spent on this kind of work to make pupils fairly proficient.

3. Tabular work with rules and leaders.
   Mathematics necessary to figure out job.
   Program blanks, report blanks, statements, charts, diagrams, etc.

4. Broken reading matter.
   Work calling for considerable judgment in regard to spacing, margins and general planning; programs, invitations, posters and similar work.

This should be attempted only after considerable practice in other forms above mentioned.

V. Talks on methods of illustrating.
   a. Woodcuts.
   b. Stereotype and chalk plate.
   c. Zinc etching.
   d. Photo-engraving.
   e. Half-tones.
   f. Electrotyping.
   g. Stereotyping from linotype composition.

VI. Excursion to an engraving plant where processes may be observed.

VII. Practical work.
   1. Woodcut; each pupil to design and make a woodcut; tail piece; initial letter (possibly in two colors).
   2. Zinc etching; same as for woodcut; book plate for library; illustration for school paper; program cover.
      Combination of these designs with type composition.
   3. Presswork—making ready of tympan; overlay and underlay; proper impression and inking; method of feeding.

VIII. Excursion to lithograph printing plant.

IX. Excursion to newspaper plant.

SUMMARY.

In conclusion I wish to emphasize the following points by way of summarizing what has been said above.

1. A course in printing is valuable educationally, not merely manually and technically.

2. On the manual side it appeals to such of the students as are of a decided literary and art bent, who are not reached by the other manual or shopwork which is concerned more with mechanical interests. Thus it furnishes manual activity along the lines in which their interests center.

3. The course as planned above would give insight into one of the

important industries of the world, an industry which has contributed much to the progress of the world.

4. A "social art"—all school interests may focus in printing.

5. Products of pupils' work is of a practical, usable nature. Much of the school printing can be done by pupils, and this is valuable work to the pupils as well as to the school. The fact that his efforts and skill have a definite value in the community in which he lives is of the greatest value to the pupil. This opportunity of being socially productive, is one which should not be neglected. Too little opportunity is offered the child in the home as well as the school. The utilization of a printing plant in this way would put printing on a par, if not above, other forms of manual work.

WORDS ARE TO BE DELIVERED FROM THE LIPS AS BEAUTIFUL COINS NEWLY ISSUED FROM THE MINT, DEEPLY AND ACCURATELY IMPRESSED, PERFECTLY FINISHED, NEATLY STRUCK BY THE PROPER ORGANS, DISTINCT, IN DUE SUCCESSION AND OF DUE WEIGHT.

METHODS AND ARRANGEMENT OF SUBJECT MATTER IN GRAMMAR SCHOOL WOODWORKING.

IRA S. GRIFFITH.

IT is assumed that grammar-grade woodworking has a subject matter and that it is desirable to have an orderly arrangement. Such assumption may seem unwarranted to some—to those who labor in private institutions where the instruction is individual or nearly so. It is believed, however, that to the teachers of woodworking in grammar grades of public schools where for economic reasons classes of considerable numbers must be cared for, the necessity for a careful selection and arrangement of the subject matter is very evident.

It has taken some years for the manual training movement to recover from the extremes into which the late psychology and child-study movement had lead it. The exhaltation of the "individual" and the reign of the "self-expressionist," it would seem, is about over. Not that this latter movement was an evil—far from it. Its influence was needed and came none too soon. Like other great movements, however, it lead some teachers to extremes, causing them to overlook the good in the old with the result that the new alone has proven no more desirable than the old alone. The pendulum of opinion is returning and it is for manual training men to try to determine by an exchange of ideas where the sanest position lies.

In this discussion we should ever keep in mind that the American public school system is maintained mainly to prepare boys and girls for good and useful citizenship; that this is a democracy in which neither individual nor class is to be exhalted unduly and that our system of education must result neither in the chaos of anarchy nor the dull formalism of a despotism. To the writer, it appears that manual training as practiced before the psychologist took possession was quite typical of the countries from which its influence came, Russia and Sweden—formalism. Under the influence of the most radical of the psychologists, manual training became synonymous with educational anarchy.

The best American citizenship cannot be developed by means of either the new alone or the old alone. There must be due attention paid to the development of the individual but that same individual must learn that he is but one of many and that he must do some things be-

cause they make it possible for all to enjoy equal rights and privileges. With this thought in mind, orderly arrangement of subject matter and class instruction, made necessary in large schools, will be looked upon as helpful rather than harmful in the preparation of the individual for citizenship.

It has been said[1] that members of society may roughly be classed into four groups: those who think without doing, those who do without thinking, those who neither think nor do, and those who think and do because of their thinking. This fourth class comprise the productive, constructive, organizing element of society. It is the function of the public schools to produce members of this fourth class. It must be evident to all that for the production of a thinking and doing individual the two forms of activity should be carried on side by side; the doing growing out of the thinking, and the thinking made clear and definite through the doing." In this quotation the writer sees the proper relation of those two essential elements that make manual training valuable as a school subject—the thought element and the element of skill. Manual training suffered by having the one—skill—unduly emphasized when our European importations were made. Recently it has suffered by having the other—the thought side—unduly magnified. These two elements are of equal importance.

The practical application of a system that would make the most of each of these elements has been a source of no little disappointment. Effort in one direction seemed always to result in a sacrifice in the other. That is, when the thought side was emphasized there was a falling off in the accuracy of the results. When skill was magnified it was attained only with a sacrifice of the thought element. With many misgivings the couclusion was reached that the introduction of original thinking on the part of the pupil must mean somewhat of a sacrifice on the skill side. Concerning this phase of the subject Prof. Richards writes: "In order to develop in the highest degree independence of thought and power of initiative the pupil must be given opportunities for determining ends and working out means. Only in this way is the natural cycle of mental activities—thinking, feeling and doing—fully realized and made effective. The practical realization of this principle means, of course, a distinct problem of instruction. The problem is essentially one of proportion and balance between freedom of expression on the one side and skill or mastery of process on the other. Extreme emphasis on the one leads

[1] By Supt. L. D. Harvey.

inevitably to a class of crude and ill-considered products while attention restricted to the other results in mere drill and formalism."

Again, in the March number of *The Manual Training Teacher,* Mr. Chas. L. Binns, an Englishman just returned from a trip through the United States, writes of manual training in the grades as follows: "The lack of exactness is the main defect of American manual training. But there are many compensations to be balanced against this, and these arise chiefly, in my opinion, from the fact that the teacher is allowed more liberty to follow his own judgment in teaching the subject than is the case here. He has more scope for exercising his initiative, with the result that he retains the freshness of interest and enthusiasm for his work that our own stereotyped and restricted schemes do much to quell. There is a fine spirit of free activity, eager interest, and industry permeating most of the manual training class rooms. Even the inferior work is done with a happy glow of achievement that half excuses it. * * * To emphasize unduly the aim of rigid mechanical accuracy generally means a sacrifice of the thought side of the work. Those qualities which lead eventually to the realization of the pupil's highest powers—such qualities as intelligent self-direction; an alert resourceful attitude of mind; and power to plan means to an end—are too valuable to lose for such an aim. * * * At the same time a system of hand work that ignores a reasonable standard of accuracy does not count for much. In the course of my visits I found more than once not only an almost entire disregard for exactness in the work of the boys, but also an almost entire neglect on the teacher's part to strive for it. Something may be said for a method which grants the pupils liberty to express themselves freely in their work, if the results are critically examined and the errors pointed out, but to accept and pass complacently work manifestly inferior is quite inexcusable. There is an element of haste about some of the work which may account for some of this."

We may conclude (1) that it is not only desirable to organize the grammar grade manual training but that it is necessary to do so if the best results are to be attained; (2) that whatever system is adopted it must make allowance for equal emphasis on the thought element and upon skill.

What system shall we use? It is pretty generally conceded that manual training as exemplified by the Russian system of joint making or the Swedish system of model making fails to lead forth the powers of the child to the fullest extent. The comparatively new educational the-

ory that interest is the indispensible basis of every method of education is sufficient to condemn the Russian system so far as its application in the grades is concerned, while Swedish Sloyd, unmodified, is weak in that it fails to take into account the reflective phase of interest, namely, the power of self-initiative. Extreme "educational manual training's" greatest weakness lies in its undue emphasis upon the thought element resulting in too great sacrifice of that other equally important element, skill or accuracy. The manual training movement is to be congratulated in that all signs just now seem to point to its speedy delivery from the hands of these latter extremists. Out of past experiences with the joint making Russian system with its admitted disciplinary value, the Swedish model making with its effort to utilize the energy of the worker toward useful products, and the self-expression of the pedagogical movement with its attendant elements of interest and initiative is to come, it would seem, a manual training practice that is to be marked by a combination of the best of these systems with a consequent elimination of the weaknesses of each.

The outline for woodwork suggested in the Illinois State Course of Study, credit for which is due mainly to Charles A. Bennett, the chairman of that committee, has proven a source of very great help to the writer in his efforts to properly present the subject matter of woodwork to boys of the seventh and eighth grades. The introduction to this course is well worth repeating and is in substance as follows: "Any course in woodworking worthy of a place in the eighth and ninth grades of public school work should meet the following requirements:

"1. It should arouse and hold the interest of the pupils.

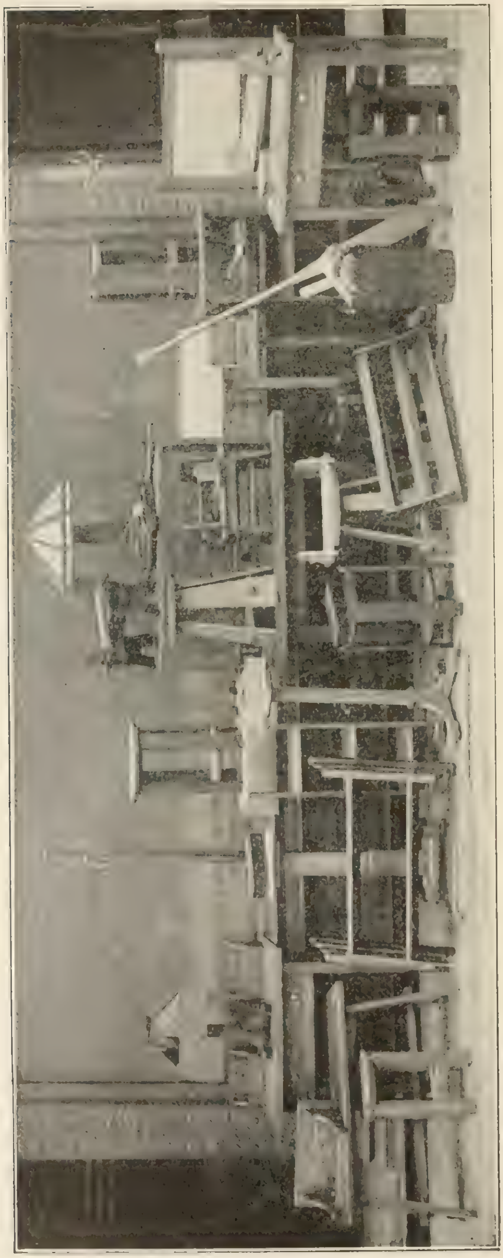
"2. Correct methods of handling tools should be taught so that good technique may be acquired by the pupils.

"3. Tool work should be accompanied by a study of materials and tools used in their relations to industry. Special attention should be given to the study of trees—their growth, classification, characteristics and use.

"4. Drawing should be studied in its relation to the work done.

"5. The principles of construction in wood should be taught thru observation, illustration and experience.

"6. At least a few problems should be given which involve invention or design or both, thereby stimulating individual initiative on the part of the pupils.



MADE BY GRAMMAR GRADE PUPILS, OAK PARK, ILL.

"The course is arranged in groups, each group representing a type of work. These groups are given in the order of procedure. The teacher is expected to provide problems of the greatest possible value educationally. This means that the things to be made should be worth making and that the process of making them should be interesting to the student.

"From this it follows that the things to be made must come to the pupil in an order which gives reasonable consideration to the difficulties to be encountered in making them.

The accompanying outline is not very different from the outline given in the Illinois State Course of Study, and is the result of a series of experimental tests under normal public school conditions. In the schools where the experiment was tried the time allotted was twice that designated in the state course, thus permitting a more gradual introduction of new elements.

Column one describes the condition of the stock when given to the pupil. That the first piece of work may be as simple as possible, the stock for is is prepared by being planed on four surfaces. Colunm two states the principal processes used in constructing the article or articles of the respective groups. Thus in Group 1, the pupil's attention is centered upon properly laying out his work. This, simple though it is, with the whittling of the ends, has been found sufficient for the first piece. While the faces of this first piece are not planed by the pupil himself, the meaning of the terms working face and joint edge are explained and marked by the pupil and their use insisted upon in the laying-out process.

OUTLINE OF REQUIRED WOODWORK.

Grades 7 and 8, Oak Park, Ill.

GROUP I.

STOCK.	PROCESSES.	TOOLS.	TEXT.
Soft Wood S-4-S	1. Marking faces 2. *Laying out* 3. Whittling	Rule Trysquare Pencil Knife	Page....... Page....... Page....... Page.......

GROUP II.

Soft Wood S-4-S	4. Gaging 5. *Backsawing* (to line) 6. Boring	Gage Backsaw Brace Bits	Page....... Page....... Page....... Page.......

OUTLINE OF REQUIRED WOODWORK—Continued

GROUP III.

STOCK	PROCESSES	TOOLS	TEXT
Soft Wood S-2-S	7. *Planing* edges 8. Planing ends 9. Backsawing (parallel to line) 10. Laying out curves 11. Vertical Chiseling 12. Sandpapering	Jack-plane Block-plane Dividers Chisel	Page....... Page....... Page....... Page.......

GROUP IV.

STOCK	PROCESSES	TOOLS	TEXT
Soft Wood Rough	13. *Surface Truing* (Complete squaring up) 14. Beveling 15. *Ripsawing* 16. *Crosscut Sawing*	Smooth-plane Winding sticks Rip-saw Crosscut saw	Page....... Page....... Page....... Page.......

GROUP V.

STOCK	PROCESSES	TOOLS	TEXT
Soft Wood Rough	17. Cutting Stock 18. *Bow sawing* 19. Rounding Edge	Bow-saw Spokeshave	Page....... Page.......

GROUP VI.

STOCK	PROCESSES	TOOLS	TEXT
Soft Wood S-2-S	20. Surface Smoothing 21. *Design.*		

GROUP VII.

STOCK	PROCESSES	TOOLS	TEXT
Soft Wood S-2-S	22. *Box Construction* 23. Nailing 24. Setting Nails 25. Fastening with screws	Hammer Nailset Screwdriver	Page....... Page....... Page....... Page.......

GROUP VIII.

STOCK	PROCESSES	TOOLS	TEXT
Chestnut Rough S-2-S	26. Exercise—Chiseling *Grooves.* Fitting Parts. 27. *Application* of groove joints.		Page.......

GROUP IX.

STOCK	PROCESSES	TOOLS	TEXT
Oak Rough S-1-S and S-2-S	28. Exercise—*cross-lap joint.* 29. *Application* of cross-lap joint.		Page.......

It will be noted that in thus marking the faces without the pupils first planing them the order of "complete squaring up" of rough stock is not followed. The writer has in time past required the complete squaring up of rough stock for the first piece. Experience seems to prove that it is

not best to force so many new elements upon the seventh grade beginner, as must of necessity be when this is done. Not until the fourth group is reached is stock entirely rough given the pupil. In Group 3, no broad surface planing is required but the pupil is now given to understand the natural order of procedure and is told that the handicap he has been enjoying is to be removed in the next group, as the stock will be wholly in the rough. After several pieces have been worked out of the rough stock and the pupil has learned the "order", stock mill-planed on two surfaces is provided. To require him to continue to work on rough stock would be not only to discourage him but would be contrary to commercial practice. Exercise pieces, however, are in the rough that the pupil may have an occasional review of this important operation.

First attempts at sawing are usually far from satisfactory hence the stock for projects in Group 2 is cut sufficiently long to allow of half a dozen trials before the final cut. Soft woods are used in the beginning groups, after which hard woods are used. As great a variety of woods as possible is utilized that knowledge of the various properties may be the more readily obtained. For convenience in handling the stock, as few thicknesses as can be, are used in any one group.

In the third column tools necessary for performing the processes indicated in the second column are named. In the fourth column pages of the text on woodworking to which the student is to be referred are given. The necessity for a good text to accompany but not to take the place of the demonstration is well appreciated by many teachers of manual training. With a text in the hands of each pupil a lesson may be assigned and the pupil required to familiarize himself with the text and illustrations relating to the subject matter at a period previous to demonstration. The use of such a text removes most effectually the necessity for a constant repetition of oral instruction. With a text there is never any excuse for a pupil's bothering the instructor with his otherwise semi-valid excuse of "I forgot," or "I was not present when you gave the demonstration," etc., etc. In the use of text books the manual training teachers might well profit by the experience of the science teachers. It is recognized that texts can be abused and made the means of lifeless teaching, as is frequently the case in unapplied mathematics, but such danger is not great in manual training.

In Groups 8, and 9, will be found exercise pieces. In this respect the outline differs materially from the State Course, no exercises being suggested therein. One of the advantages claimed for the group

arrangement was that it permitted class instruction at stated intervals, thus reducing individual instruction to a minimum. For illustration, a class would begin Group 1, continuing to work upon the problems of that group until all but the few acknowledged failures had completed the work required in that group, after which the class was to be instructed in the new things of Group 2, this to proceed through the whole course.

The work of the groups overlap each other, for, as soon as a pupil finishes one problem in a group he begins another problem in the same group unless he is the slowest worker in the class.

When we are ready to begin a new group we are confronted with the question of whether to give the instruction belonging to the new group and allow the boys to proceed with their unfinished work of the old groups or to start them on the problems of the new group. To proceed with the old is objectionable in that the worker forgets his new instruction before he has opportunity to apply it. To start new work is bad in that the pupil will have lost all interest in the old when asked to complete it after the new is completed. Not to complete the old at all would be a practice too vicious to be tolerated for a moment.

In the seventh grade this overlapping is not a serious problem, for the objects being small and quickly finished allow all to finish the old group before the instruction of the new has faded. In the eighth grade, where the objects are larger, this objection is a serious one.

As stated before, the aim of the group arrangement is to permit of class instruction at the beginning of each group. To make this effective the practice or application must follow within a reasonably short time. Here the "exercise" seems to offer aid.

If ever an exercise has a legitimate use, it has it here. The great objection to exercise pieces lies in their inability to create a vital interest on the part of the pupil. The writer has made it a practice before each

exercise to talk over the application and to state briefly the need of the exercise, first, that the class, because of the numbers, must be instructed all at the same time; second, that joints, unlike the simple pieces previously made, cannot be patched by reducing the size as in the bread board, when lack of knowledge or skill necessitates; third, that to postpone the application of the instruction would be unwise. As the time required for making the exercise is short there has never been a lack of interest either in the exercise or the unfinished objects of the old group to which some must rturn after completing the exercise.

To the writer it seems unnecessary to apologise for this use of exercises. He has felt free to utilize parts of any system which serve his purpose. He does feel, however, that a long continued series of exercises in grade woodworking would be fatal.

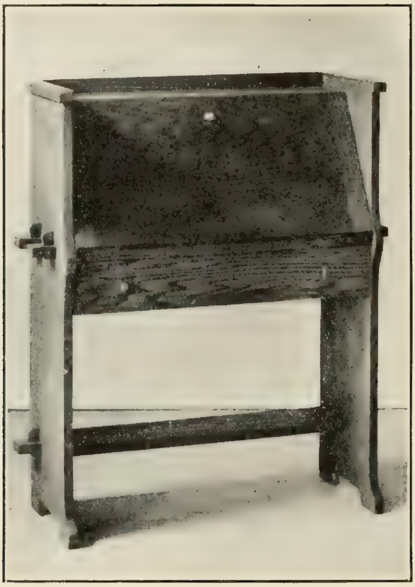
American school methods have been criticized by Europeans as being superficial and lacking in thoroness. In our eagerness to "develop the individual" it may be that we have made ourselves subjects for such criticism to a certain extent. We need not fear the introduction of this small amount of drill and formalism, especially when there is no sacrifice of interest or incentive.

A few words about the manner of presenting the problems: In Group 1, all are required to make the same object; the rapid workers duplicate. Group 2, all make the same object; the rapid workers take in order other supplementary ones.

Groups 3 and 4 the method is the same as in 2. Group 5, choice of three or four objects. Group 6, variation and design of a given object, and decoration. Group 7, choice of any of the five or six objects. Groups 8 and 9, exercises followed by various applications of the same.

It is impossible to teach a pupil a thing that is entirely new to him. There must be a fund of "known" through which the unknown may be made known. For this reason drawings and sketches are plentifully provided to furnish knowledge for future original drawings. Modifications are premitted where a fair degree of merit is shown. Unusual ability is recognized. Originality is encouraged but never forced. Experience has shown that better results are obtained, both in the development of ability to think and to do, if the ability to do is given a maximum of attention at the beginning of the course, the opportunities to think original thoughts being introduced gradually as the pupil's knowledge and skill increases. In the beginning groups the sizes or dimensions of the

pieces to be made are fixed, no variations being permitted except as poor work necessitates. A pupil who has done his best is not required to repeat however poor the result. Requiring all to make the same pieces in the beginning groups permits comparison of results and the establishment of standards of accuracy as well as making it possible to give definite instruction with a minimum of talking.

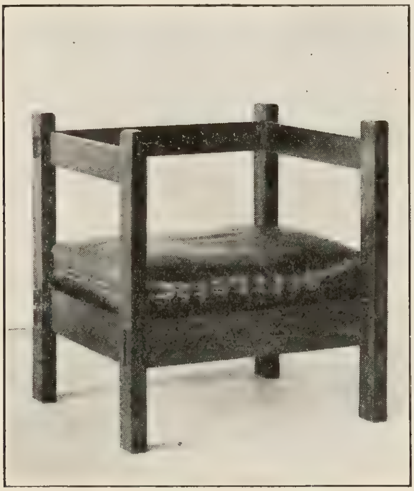


Another reason for emphasizing technique and processes at the beginning is that interest is so easily directed. A beginner is interested in anything. In fact, a few exercises—not more that two or three—might be introduced at the very beginning without in any way violating the principle relating to interest previously referred to. The writer does not make use of exercises in this way but can understand some of the advantages secured by so doing.

Along with the woodworking course, mechanical drawing as it relates to the work being done in wood is developed.

Toward the end of the year's work those boys who have completed their pieces and have not time to complete others for themselves before

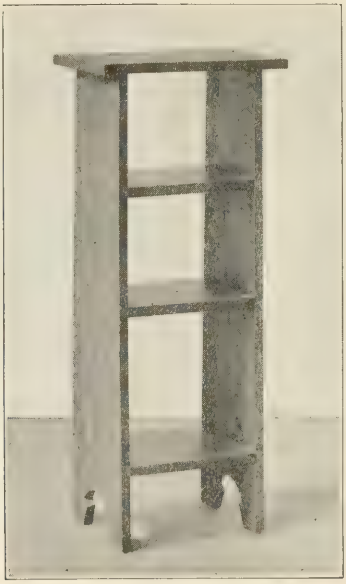
the close of the year, are put to work upon some piece for their school building. As an inculcator of the altruistic, this kind of work has never proven a very great success, but as a busy work it has been found worth continuing. The busy work at the close of the year for the seventh grade consists in preparing stock for the entering classes of the following year.



A pupil pays the cost of all the material which goes into a piece, providing he wishes to take it home. This applies even to the smallest pieces. As a result, no pieces are taken which are not really wanted. It permits the making of more pretentious pieces than would otherwise be possible and causes instructors to seek to provide problems which shall be worth the effort spent in making them.

In conclusion, (1) It is necessary to organize the subject matter of grammar grade manual training if it is to maintain the respect of educators and men of industry. (2) Such organization and the methods of instruction must recognize the equal importance of skill and of original thought on the part of the pupil. (3) It is fruitless to expect as high a degree of skill and of original thought to be obtained when developed together, as might be attained in either, developed alone. Educational ideals demand that both receive attention. (4) However well the subject matter may be organized the instructor is the determining factor for good

or bad teaching, this is peculiarly so in manual training because of the balance which has to be maintained between accuracy on the one hand and individuality on the other. This variable affects not the class but each pupil. It is never subject to final settlement and the teacher who can wisely meet the demands made upon him, needs, in addition to a well organized subject matter an unlimited supply of good common sense.



THE VALUE OF TIME AND MATERIAL.

M. W. Hull.

IS there any lost motion? Are we cultivating in the boys and girls the fullest possible appreciation of the value of time and material? These questions manual training teachers who are constantly on the lookout for ways and means of strengthening their work, frequently ask themselves.

Some time ago a man prominent both in the national industrial movement and in manufacturing circles was asked in a state teachers' convention for his criticism of our present manual training work in the public schools. He said: "My harshest criticism is that the boys and girls do not have a proper appreciation of the value of time and the cost of material. I can take a boy into my shops and he will do twice as much as you make him do in school in the same length of time."

How about it? Is there merit in this criticism? Let us examine conditions. Possibly the critic is wrong. To begin with, we must recognize that there is a different kind of pressure brought to bear on the boy in the two places. In the shop he does not feel sure of his job. If he lags too much he is discharged and another is ready and anxious to take his place. He knows very well what will happen.

In school he is fairly sure of his place. His teachers are doing their very best to keep him in. They are constantly urging him to do his duty. If he does not do it, they do not discharge him; they devise new ways to persuade him, trusting to the hope of final improvement. That is a proper function of the public schools and the teachers are to be commended.

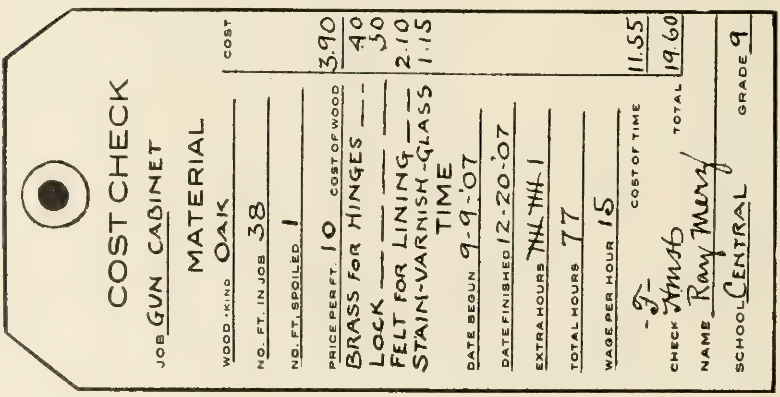
Again, there is probably some difference in the character of the work, which makes the boy in the shop appear to be doing more than the fellow in school. He undoubtedly does the same thing more times, consequently he can turn out more product. The boy in school, as soon as he can do one thing well, is given a new problem and has to spend more time thinking how to proceed. The product is more in his brain and not so much in concrete output.

Nevertheless we all know that there is more or less waste in time and material. What can we do toward overcoming it?

During the past year I have been using a cost check, with most pleasing results. I had printed on manilla shipping tags, headings, suitably arranged, for the following data:

Job	Miscellaneous	Cost of time
Wood (kind)	Date begun	Total cost
No. ft. in job	Date finished	Check (instructor's)
No. ft. spoiled	Extra hours	Name
Price per ft.	Total hours	School
Cost of wood	Wage per hour	Grade

The blank tags cost eighty-five cents per thousand. The paper is tough and the reinforced holes make them suitable for hanging on a nail or stringing on a wire ring. When the boy starts, he fills out that portion that can be filled out at the time and places the tag on file.



When he has finished his job, he works out his problem on a piece of waste paper, on the blackboard, or on the back of the tag, submits it to the instructor for inspection and then completes filling out his tag. The sixth, seventh, eighth and ninth grades have been rated at seven and one-half, ten, twelve and one-half and fifteen cents per hour, respectively.

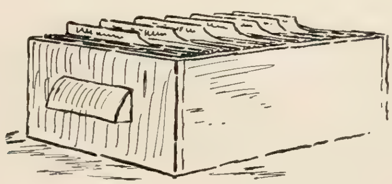
I find the boys eager to know the facts set forth on the tag and watchful for the chance to consult the instructor with the least loss of time. When a boy runs up to three or four dollars the cost of an article that he can buy for one dollar, he usually volunteers the statement

that he needs to attend better to his business. The tag presents complete details of the work to the instructor in concise form. The cost of materials and the value of time are brought to the boy, individually, in a way which makes him appreciate more fully their importance. No chance is allowed the boy to skip the working of the problems imposed.

The teacher has a complete record of the boy's work made by the boy himself, which he can transfer to his record book at leisure. If more convenient the card index form can be used. It has some points of advantage. The cost of either system is very small.

Some educators may object to the bringing of this shop practice into the schools on the ground that it emphasizes too strongly the matter of dollars and cents, that it endangers the highest ideals. I believe there is no ground for fear. This standard of cost is the one the boy best understands. He hears about it on all sides. The boy who works his way through school appreciates the value of time, chiefly, because he has figured it in dollars and cents. The cost in money is usually an indication of value.

I am thoroughly convinced, from my own experience, that the cost check system applied to manual training in the upper grades, is a successful means to a useful end—the conserving of time and material—and that no harmful effect on high ideals results. While I believe there is perhaps less loss of time in the manual work of our schools than in the other kinds of work, there is always a chance for improvement and it will do us no harm to take the manufacturer's criticism to heart. The "Do it now" motto that hangs on the wall, may well be supplemented with another, "Do it without waste of time."



EDITORIAL.

Trade School Preparatory Course

In the October number we expressed a doubt concerning the advisability of establishing public general industrial schools independent of the high schools now found in every city and town that pretends to provide adequate education for its young people. We agreed with the New York State plan in reference to the establishment of independent trade schools but proposed that the general industrial training preparatory to the trade school be given in the high school manual training department with the co-operation of the other departments of the school, and that this department be modified in respect to its time allowance, and the character of its work so as to meet reasonable demands from the trade school.

Shortly after the publication of this editorial we received two letters commending our position. One of these brought to our attention the recent action taken in Milwaukee looking to the establishment of a high school course such as was implied in our editorial; namely, a two-year preparatory course for grammar school graduates who are intending to enter the school of trades. Ever since the trade school in Milwaukee was absorbed by the public school system, the director of the school, Mr. Charles F. Perry, has been trying to find a way to care for the eighth grade graduate until he is old enough to enter the trade school. The Wisconsin law says this age is sixteen years. By adopting a trade school preparatory course, the two years from fourteen to sixteen will be profitably bridged and many boys will be saved for the trades who otherwise would be lost in the interim and drift into unskilled labor. Director Perry believes that at last they have found a happy solution of the problem, and Superintendent Pearse hopes to have such a course arranged during the present winter.

To us this seems a much more logical solution of the problem than would be the establishment of an independent school for the purpose. If this course is made rich in industrial studies, as it certainly should be, it will give the student an excellent preparation for the trade school, and will be likely to hold him through the course, but even if he drops out after one year, he will be so much the better prepared for earning a living. The cost of establishing such a course in a high school which is

already well equipped for manual training work need hardly be considered, since most or all of the needed equipment is already at hand, and presumably the cost of teaching pupils in this course would be no greater than in any other. Probably the only extra expense would be due to the increase in the total number of pupils in the school. —C. A. B.

Elementary Industrial Education The problem of industrial education in the public schools, so far as it relates directly to the preparation of the artisan for his life work, must eventually become the problem of the elementary schools. The manual training high school, the technical high school and the vocational high school, as at present conducted, all demand the completion of the traditional elementary school course as a pre-requisite for admission, and the claims for their graduates are that they go on to higher technical education or become draftsmen. superintendents and foremen. None of these schools reach the mass of children from which the supply of skilled workmen must be drafted. It is a question, too, whether the work of the artisan will appear so alluring that any large percentage of those who have successfully completed the work at present demanded in the eight grades of the elementary schools will deliberately plan to prepare for that work with the thought of making it a means of livelihood.

The great concern of educators at the present time is the large number of pupils who leave school in the lower grammar grades. A fact of as great significance which is overlooked is the large number of pupils remaining who are behind their grades. In the large cities, it is probably a fair estimate that fifteen per cent of the boys who enter the sixth grade are of, or older than, the age at which they should graduate from the eighth grade and of an age when they are not subject to the compulsory education laws. Many reasons would be found for this loss of time, but in the final analysis it must develop that a large percentage of the loss is due to absence of those mental qualities which respond readily to the demands of the elementary school curriculum. This does not necessarily mean that pupils lack ability, but that their powers are along lines which the school work does not develop. Their minds are naturally appealed to by things that are very concrete, whereas the school courses deal largely with things that are abstract. The elementary school courses fix arbitrarily a standard of culture and a means of development toward that standard to which all must conform, rather than offering opportunities for development along lines for which pupils are temperamentally fitted.

There should be a differentiation of work in the grammar grades to meet more fully the varying needs and capabilities of pupils whose powers are manifestly in the direction of concrete manual expression. Such a broadening of the course would at least leave an open door to a large number of pupils who are practically forced out of school by stress of years, and would serve as an appeal and incentive to the larger number who leave the schools because they seem to offer nothing for the future.

Briefly stated, the problem involves the broadening of the elementary school course to give more equal opportunity along the lines of natural aptitude, by omitting much of the purely technical and abstract work of the grammar grades for certain classes of pupils, and by introducing a large proportion of hand work, embracing the fundamentals of the industries, domestic science and domestic art. Such a differentiated course would lead naturally to the trade school; it would prepare for apprenticeship; it would better prepare many pupils for life in general. It would look to the time when the elementary schools should recognize a standard of culture not dependant upon examinations in intricate arithmetical problems and technical grammar. —W. E. R.

ASSOCIATIONS.

William T. Bawden, Editor.

THE TEACHERS' ART CLUB.

The celebration of the sesquicentennial anniversary of the founding of Pittsburg caused the first meeting of the Pittsburg Teachers' Art Club to be postponed from September 30th to October 7th.

After the opening address by the president, Mrs. M. E. Van Wagonen, the Club listened to reports from its members who had attended the London conference. Miss Alice Henry, assistant supervisor of drawing, Pittsburg, read a very comprehensive paper setting forth the general aim of art teachers as described by their representatives at London.

Miss Agnes Lawton, supervisor of drawing, Homestead, briefly described and compared the exhibits from various countries. Others who had been in attendance at the London Conference, and who contributed to the discussion, were Miss Agnes Slaymaker, Swissville, and Miss Jean Kimber, Pittsburg Academy.

During the evening plans were made for attending the meetings of the Pennsylvania Federation of Women's Clubs to be held in Pittsburg during the last week in October, at which Mr. Henry T. Bailey is to be one of the lecturers. Lucy W. Shryock, Pittsburg, Pa.

THE ILLINOIS SCHOOLMASTERS' CLUB.

The semi-annual meeting of the Club, held in Peoria, October 2 and 3, devoted its two sessions to consideration of the recommendations of the Illinois Educational Commission. The Commission has issued four bulletins setting forth tentative plans for new school legislation for Illinois. These plans provide for the creation of a State Board of Education, and also for the creation of county boards, the change of the unit of school organization from the district to the county, and a uniform plan for the certification of teachers.

The Schoolmasters' Club was the first important meeting of any considerable number of teachers that has occurred since the recommendations of the Commission have been made public, and hence it was the first opportunity to ascertain how these recommendations would appeal to the rank and file of the profession. The result of the experiment must have been gratifying to the members of the Commission who were present, for by an enthusiastic and unanimous vote, after ample discussion, the Schoolmasters' Club went on record as endorsing the general plan outlined by the Commission.

The principal speakers at the meeting were: State Superintendent Francis G. Blair, on "The State Board of Education," and Dr. Ira Woods Howerth, Secretary of the Commission, on "The Certification of Teachers." William Hawley Smith, of Peoria, when called upon to address the Club after the banquet Friday evening, characterized as "absolutely the funniest thing he ever saw

or heard" the retention of Milton's "Comus" in the reading matter required of high school students.

The bulletins that have been issued and that are to be issued by the Illinois Educational Commission can probably be secured by addressing the Secretary at Springfield.

The Department of Superintendence of the National Education Association will meet in Chicago again this year, instead of at Oklahoma City as originally planned. The change in plan was made necessary by the destruction by fire of the leading hotel in Oklahoma City and the consequent reduction in the hotel accommodations available. The date of the meeting in Chicago will be February 23, 24, 25, 1909, and headquarters will be at the Auditorium Hotel.

The program of the Minnesota Educational Association, which will be ready for distribution about December 10th, promises something new in its presentation of material and rich in subject matter. Emphasis is to be given to three phases of school work, as follows: 1. Manual and Industrial Training, continuing the discussion of last meeting; 2. The Physical or Health Side; 3. Disciplinary or Moral Value. The list of speakers includes the following: Dr. N. C. Schaeffer, Superintendent of Public Instruction, Pennsylvania; Dr. L. C. Lord, President, Eastern Illinois State Normal School, Charleston; Dr. Luther H. Gulick, Health Officer of the New York City Public Schools; Dr. George H. Martin, Secretary State Board of Education, Massachusetts; Miss Jane Brownlee, New York City; Dr. H. A. Tomlinson, Superintendent of Hospital for the Insane, St. Peter, Minnesota. There will be three half days of meetings of the special Sections, two evenings of addresses before the entire Association, and one evening program entirely informal in character. The President is C. G. Schulz, St. Paul, and the Corresponding Secretary, J. M Guise, St. Paul.

The program of the 46th Convocation of the University of the State of New York, Albany, October 22-24, 1908, included an address by President Schurman, of Cornell University, on "The Adaptation of University Work to the Common Life of the People," and two addresses upon the general subject of attention to health in the public schools.

The Executive Committee of the Illinois Manual Arts Association announces an interesting program in preparation for the sixth annual meeting to be held at Rockford, on Friday and Saturday, February 12, 13, 1909. It is recalled that at the last meeting action was taken in the interest of members who had allowed their membership to lapse through non-payment of dues. All such persons are now permitted to be reinstated by paying the annual fee of one dollar for the year ending February, 1909. Members of the Association are urged to begin the

collection of drawings, photographs, and samples of work to be sent to the Rockford meeting. Copies of the program may be obtained about the middle of January from the Secretary, Ira S. Griffith, Public Schools, Oak Park, Illinois.

The program of the monthly meeetings of the Principals' Association, Minneapolis, Minnesota, has been received. At the meeting on January 5th there is to be a debate upon the question of "The Vocational versus the Cultural Side of Education." The "vocational side" will be defended by Mrs. Warrington and Mr. Forssell, and the "cultural side" by Mr. Cleary and Miss Mary Lewis.

The Fifth Annual High School Conference was held at the University of Illinois, November 19-21. At time of going to press it is too early to obtain a report of the deliberations for this issue. There were three general sessions, one dealing with industrial education, and two half days of Section meetings. There were eight Sections: Foreign Languages, newly organized this year, English, Social Science, Mathematics, Geography, Manual Arts, Domestic Science, and Agriculture. The Manual Arts Section devoted the most of its time to consideration of the various phases of the work in drawing.

NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION.

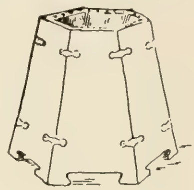
In our next issue we expect to give a report of the second annual convention of the National Society for the Promotion of Industrial Education which occurred at Atlanta, Georgia, November 19 to 21. The annual banquet was held at the Piedmont Hotel, with Governor Hoke Smith as Toastmaster, and Honorable James Wilson, Dr. Elmer E. Brown, and President Carroll D. Wright as the principal speakers on the topic: "Industrial Education as an Essential Factor in our National Prosperity."

At the other sessions the topics for discussion were: "Industrial Training thru the Apprenticeship System," "Promotion of Industrial Education by Means of Trade Schools," "Moral and Material Benefits of Industrial Education to the Nation," and "Industrial Education in the Public Schools."

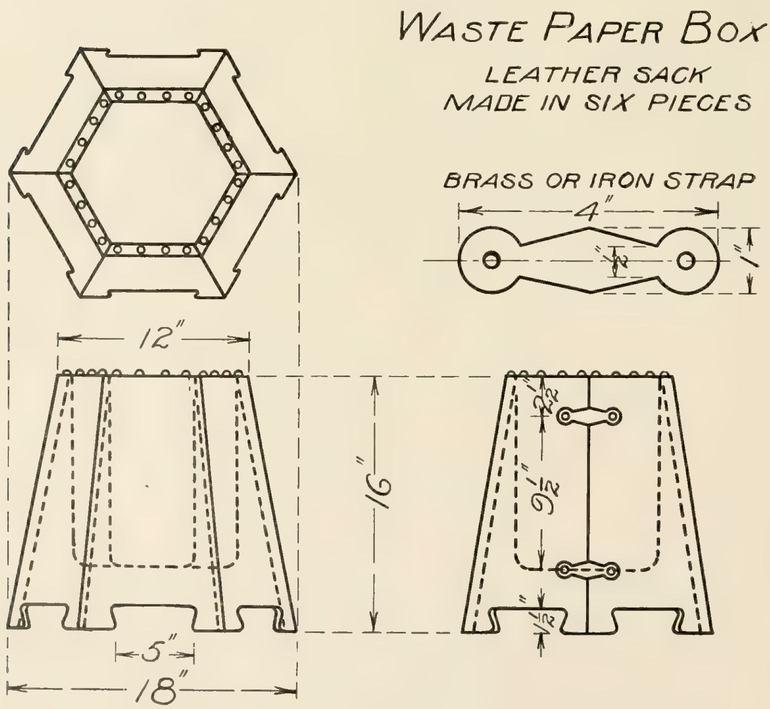
SHOP PROBLEMS.

George A. Seaton, Editor.

WASTE BASKET.



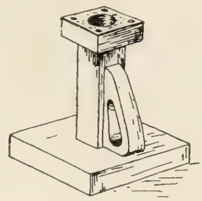
The only difficulty that will be encountered in the making of the waste basket illustrated will be in the planing of the long edges which must be joined together. If this seems too difficult for the ordinary methods, a jointer gage may be attached to the side of the plane and adjusted to the exact angle desired. The method used in joining the sides together is unique and worthy of special note. When the proper stain is selected for the basket the fastenings will serve not only their useful purpose but also as just the needed touch for ornamentation.



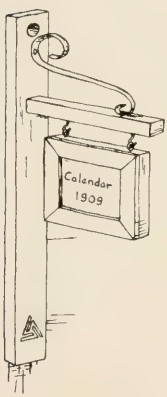
STEP LADDER.

There is little that need be said in regard to the construction of the simple step ladder, which is from the design of Philip S. Hasty of the Isadore Newman Manual Training High School of New Orleans. The entire end of each step is let into the sides of the ladder as shown. The best cross braces for the back are made from ½ inch or ¾ inch dowel rods, which must be wedged and glued into place. A small pin should be put through the lower dowel rod just inside the side braces to prevent these from sliding while still allowing them to turn. The notch at the front end of the side braces drops over short pins which are wedged and glued into the sides of the ladder. Nails and glue are used for fastening throughout..

CANDLESTICK.

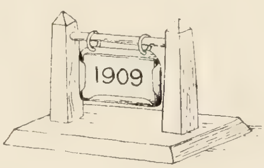


A simple form of candlestick has been submitted by E. D. Lemmerman of Cleveland, and H. C. Mohler of Galva, Illinois. The good points of both designs, which are very similar, have been combined in the drawing which is given here.



CALENDARS.

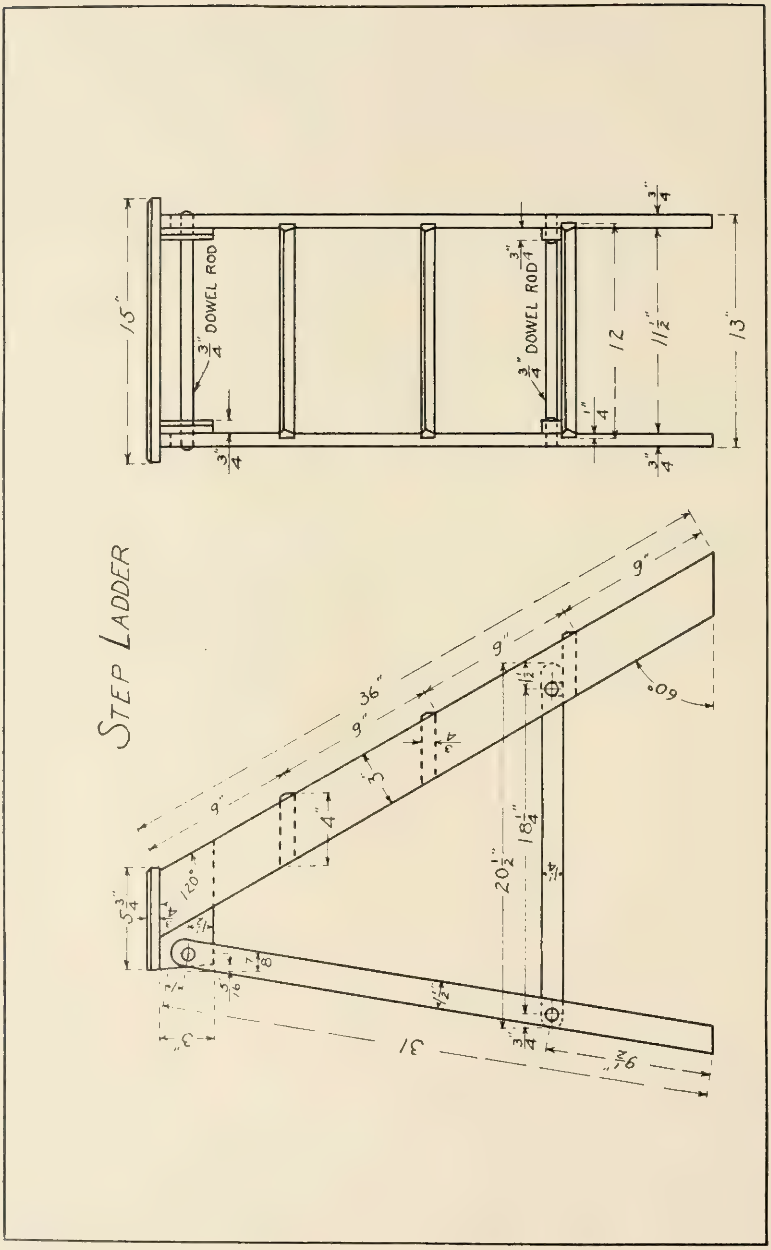
A timely project for this month is the making of some form of calendar. The two which are shown here are but suggestions for a number of forms that might be undertaken. The desk calendar holds the cards for the month in a simple sheet brass container, into which the cards are slipped from the top. The wall calendar holds the month cards in a wooden frame which has an opening toward the wall for their insertion. At the lower end of the piece against the wall is placed a monogram or guild device, either in sheet brass or carved upon the surface of the wood.

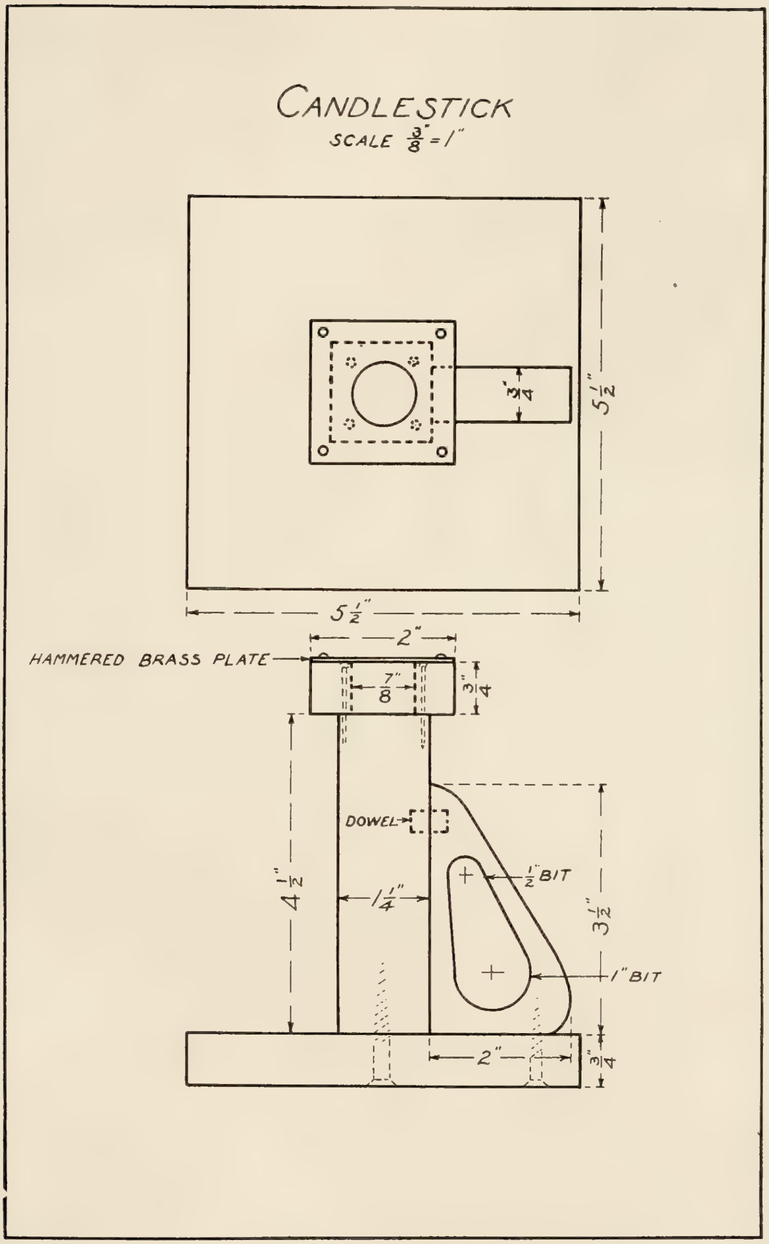


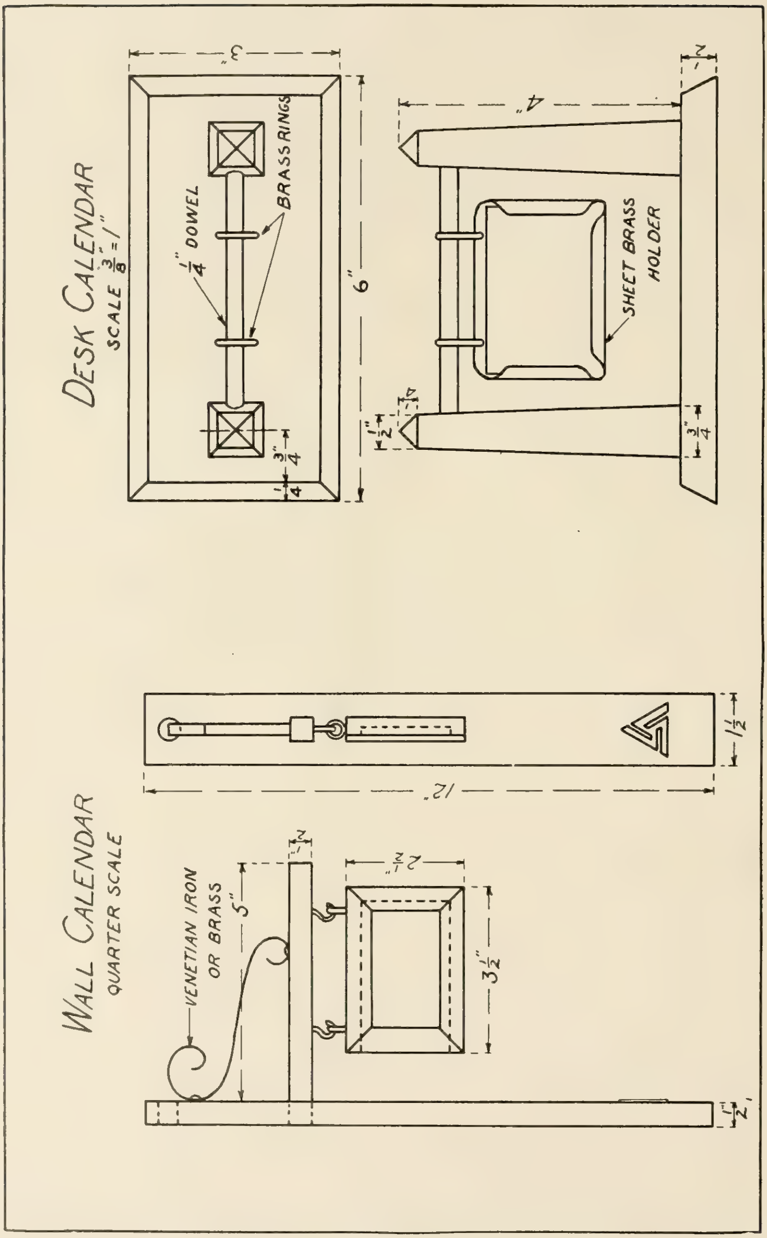
BOAT.

There is scarcely a boy who has not sailed a toy boat on a small lake or sheltered water, and to own a self-propelled boat is the ambition of many. The plans of R. L. Southworth, of Minneapolis, are intended to enable this ambition to be worked out in the manual training shop. The style of construction has been adapted to the mode of propulsion by small electric motor and dry batteries.

The hull is begun by the manufacture of the framework, which has been simplified to stem and stern pieces, keel, five bulkheads and two side rails. This framework is covered with red resin-sized building paper, which is nailed on, beginning at the stern and working forward. One piece of paper is used for each half of a section, making twelve pieces in all. A lap of three-eighths of


STEP LADDER
3/4" DOWEL ROD
3/4" DOWEL ROD 3/4
15"
12
11 1/2"
13"
36"
9"
9"
9"
9"
3"
4"
20 1/2"
18 1/4"
120°
60°
31
5 3/4"


CANDLESTICK
SCALE 3/8" = 1"
5 1/2"
3/4"
5 1/2"
2"
HAMMERED BRASS PLATE
7/8"
3/4"
DOWEL
4 1/2"
1 1/4"
1/2" BIT
3 1/2"
1" BIT
2"
3/4"


DESK CALENDAR
SCALE 3/8" = 1"
1/4" DOWEL
BRASS RINGS
SHEET BRASS HOLDER
WALL CALENDAR
QUARTER SCALE
VENETIAN IRON OR BRASS

an inch should be made wherever the different pieces join. When the paper has been nailed in place, the hull, both inside and out, is given two coats of asphaltum varnish, care being taken that the first coat is thoroly dry before the second is applied. The boat should now be covered with muslin in just as many pieces as were used for the paper covering, and two more coats of varnish given inside and out. A brass strip is nailed along the top for finish and a name plate attached at the bow.

The rudder is fastened to the tiller by making the four cuts in the edge which are shown in the detail drawing, spreading the metal until the tiller can be slipped into place, and then hammering the metal tightly about the tiller. The side arms which support the paddle may be raised and lowered until the paddle occupies the right position in the water when the boat is carrying its full equipment. Four dry cells are used, two being placed between the second and third bulkheads, and the remaining two between the third and fourth bulkheads. The motor, which may be purchased, is attached to a vertical base board placed between the fourth and fifth bulkheads. This base board is partially held in position by a horizontal board extending from one bulkhead to the other and utilized as a switchboard.

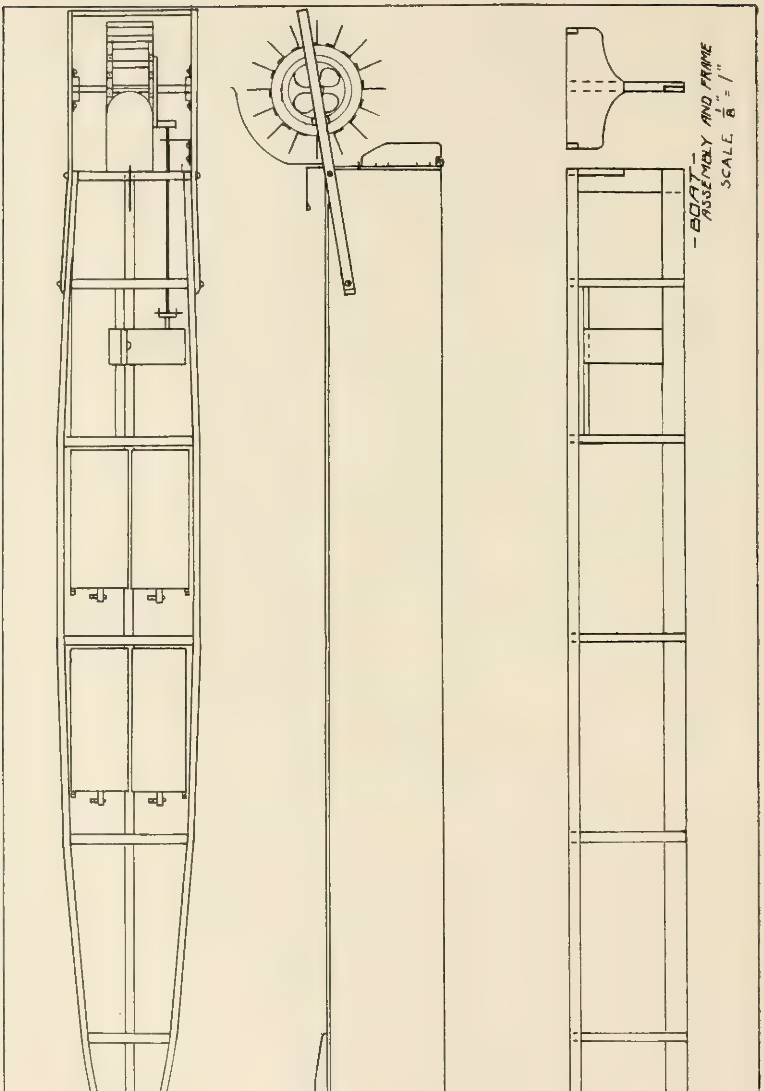
The shaft is made from an old bicycle spoke fitted with a tumble joint at the motor end and a small gear wheel at the nipple end. This gear meshes with a larger one fastened to the paddle. These gears are obtained from the Dover egg beater. The tumble joint allows for any lack of alignment in the shaft. To make it two small grooves are filed in the sides of the bicycle spoke and a piece of copper wire is wound once around, and the ends, one inch long, are left straight, the pliers being used to press the wire firmly into the grooves just filed. Each end of the copper wire passes through a somewhat larger hole at the ends of a U-shaped piece of copper attached to the motor pulley by wire, or simply driven tight on the motor shaft.

The switches are made from sheet brass held by a screw at one end and are three in number, H, B, and C, besides the current reverser which is located at R. When H is closed and C, the controller, is moved to left, the motor receives the current from one, two, three or four cells according to the location of C at 1, 2, 3, or 4. With H open and B closed and C placed at 4, the motor receives current from cells 3 and 4. These two cells can thus be switched in to drive the boat across the lake and then cells 1 and 2 used on the return trip, in this way allowing the first two cells an opportunity to rest, a very necessary arrangement with dry cells.

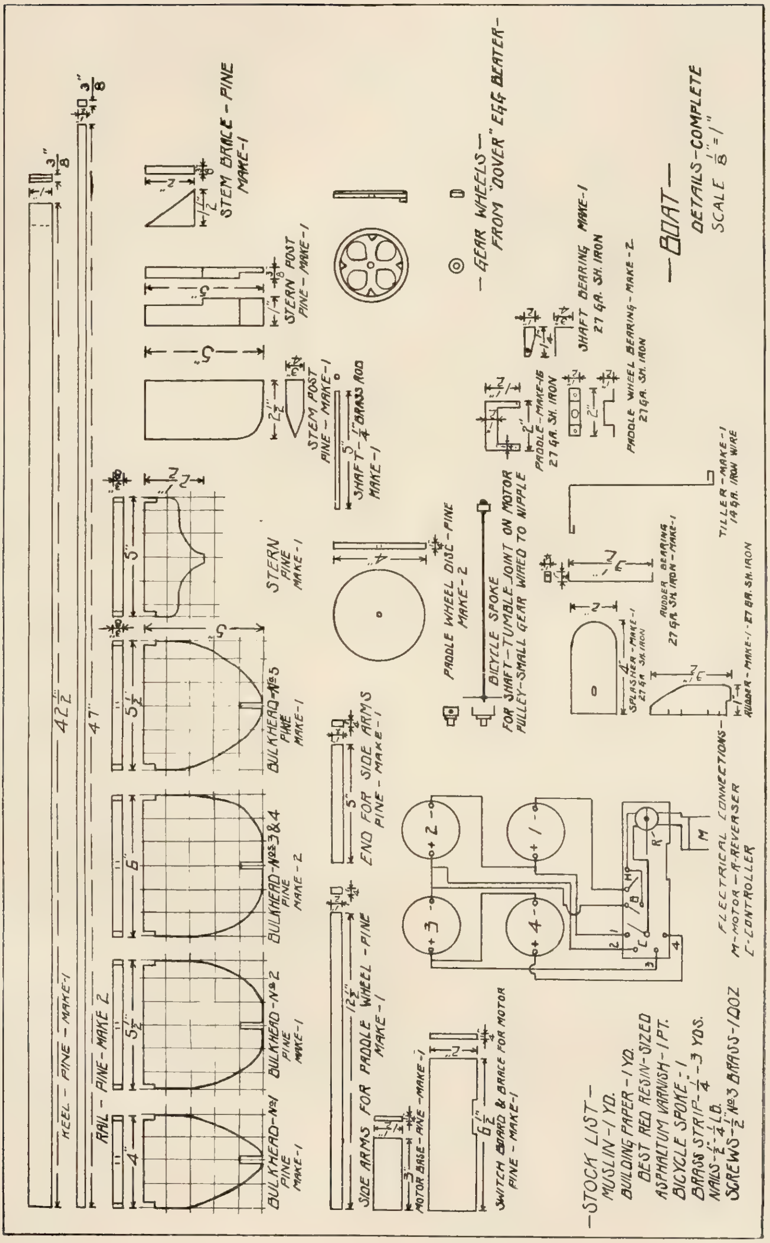
The boat may be decked over with thin wood and a cabin of painted cardboard, thin wood or sheet metal added if desired.

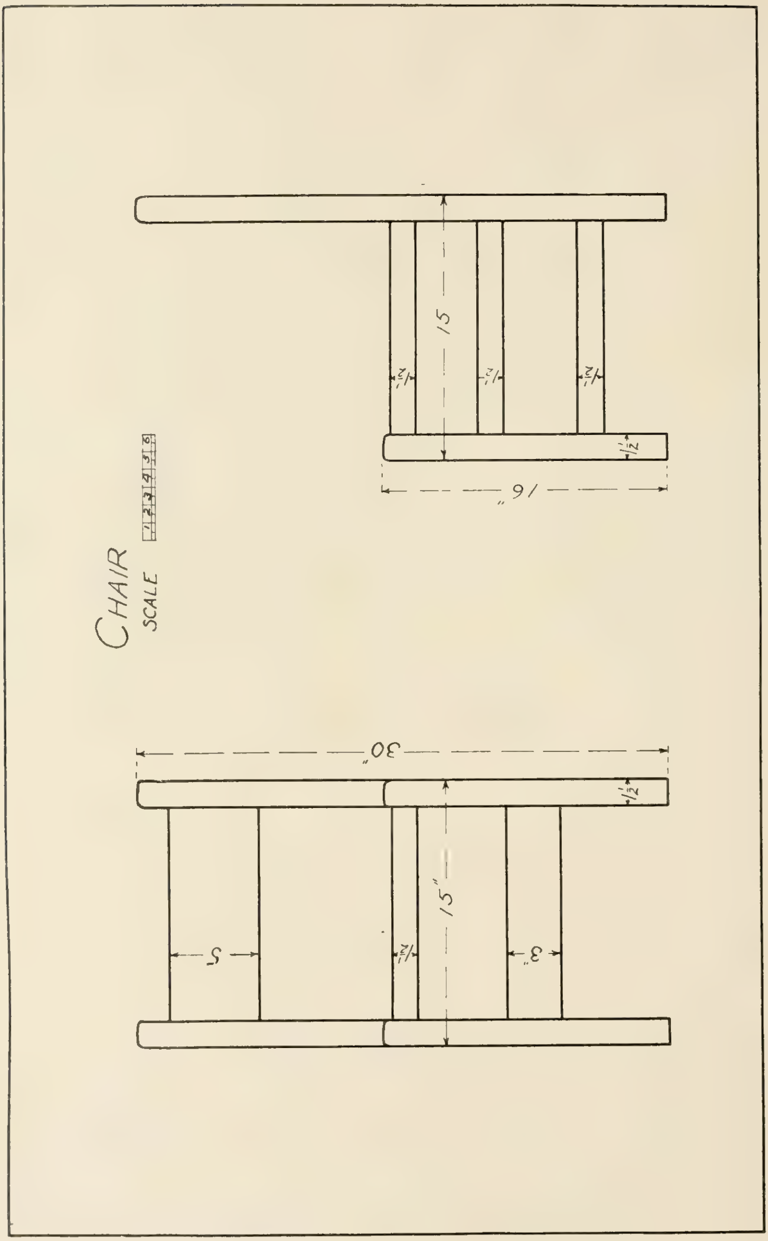
CHAIR.

The ordinary chair is a problem too difficult for some of the pupils who will be able to construct a very satisfactory one from the drawings of W. E. Roberts of Cleveland. All pieces are joined at right angles, which greatly simplifies the construction. The top is to be woven of split cane which can be obtained in two widths, 1/4 inch or 3/8 inch, either of which may be used.



- BOAT -
ASSEMBLY AND FRAME
SCALE 1/8" = 1"
WAKELET


KEEL - PINE - MAKE-1
RAIL - PINE - MAKE 2
BULKHEAD-№1 PINE MAKE-1
BULKHEAD-№2 PINE MAKE-1
BULKHEAD-№s 3&4 PINE MAKE-2
BULKHEAD-№5 PINE MAKE-1
STERN PINE MAKE-1
STEM POST PINE - MAKE-1
STERN POST PINE - MAKE-1
STEM BRACE - PINE MAKE-1
SIDE ARMS FOR PADDLE WHEEL - PINE MAKE-1
END FOR SIDE ARMS PINE - MAKE-1
SHAFT - 1/4" BRASS ROD MAKE-1
PADDLE WHEEL DISC - PINE MAKE-2
BICYCLE SPOKE
FOR SHAFT - TUMBLE JOINT ON MOTOR PULLEY - SMALL GEAR WIRED TO NIPPLE
- GEAR WHEELS -
FROM "DOVER" EGG BEATER -
PADDLE - MAKE-16 27 GA. SH. IRON
SHAFT BEARING MAKE-1 27 GA. SH. IRON
PADDLE WHEEL BEARING - MAKE-2 27 GA. SH. IRON
TILLER - MAKE-1 14 GA. IRON WIRE
RUDDER BEARING 27 GA. SH. IRON - MAKE-1
SPLASHER - MAKE-1 27 GA. SH. IRON
RUDDER - MAKE-1 - 27 GA. SH. IRON
MOTOR BASE - PINE - MAKE-1
SWITCH BOARD & BRACE FOR MOTOR PINE - MAKE-1
ELECTRICAL CONNECTIONS -
M-MOTOR - R-REVERSER
C-CONTROLLER
- BOAT -
DETAILS - COMPLETE
SCALE 1/8" = 1"
- STOCK LIST -
MUSLIN - 1 YD.
BUILDING PAPER - 1 YD.
BEST RED RESIN-SIZED
ASPHALTUM VARNISH - 1 PT.
BICYCLE SPOKE - 1
BRASS STRIP - 1/4" - 3 YDS.
NAILS - 1/2" - 1/4 LB.
SCREWS - 1/2" No. 3 BRASS - 1 DOZ


CHAIR
SCALE
30"
16"
15"
15
5"
3"

CURRENT ITEMS.[1]

Clinton S. Van Deusen, Editor.

MASSACHUSETTS.

The Massachusetts Commission on Industrial Education has established new schools or continued those previously established in the following cities and towns: Day schools—Smith's Agricultural College and Northampton School of Technology, Northampton, and the Montague Agricultural School; evening schools—Beverly, Boston, Brockton, Cambridge, Chicopee, Lawrence, Natick, New Bedford, Pittsfield, Taunton and Waltham. There is a total attendance in these schools of more than three thousand pupils.

Franklin Union, of Boston, an institution similar to Cooper Union of New York, was opened this fall with W. B. Russel as director. This is not a trade school; that is, it does not take a novice and give him a training. It is rather an industrial school taking the man who has some knowledge of a trade and perfecting that knowledge. There are courses in steam engineering and drafting, electrical courses and work in a mechanical and a chemical laboratory. There are also courses in English. All courses, for a time at least, will be given at night. The teachers in this school are not theorists but practical men, men whose early and complete school training has been supplemented by a thoro practical knowledge.

It is planned to provide for nearly two thousand pupils later but it was thought best for the opening year to limit the attendance to three hundred. The number of applicants soon exceeded this number and nearly two hundred are on the waiting list. A nominal fee is collected of those entering to insure their continuance, and unless regular in their attendance their place is filled from the waiting list. This institution is the outcome of a fund left by Benj. Franklin one hundred and thirteen years ago, which with years of growth and a large addition made by Andrew Carnegie amounted to over $800,000. From this amount the fine building at the corner of Berkeley and Appleton Streets has been erected and equipped. The building itself cost $350,000 and its character both outside and in is inspiring. In the main corridor a series of mural paintings are to be placed later consisting of ten panels showing scenes in the life of "Poor Richard," as follows: Franklin, the boy, selling his ballads in front of the old State House; Franklin, the craftsman, working in his printing office, Philadelphia; Franklin, the editor, in his editorial office, Philadelphia; Franklin, the officer, superintending the building of stockade forts on the Pennsylvania frontier; Franklin, the statesman, examined by the House of Commons concerning the repeal of the royal stamp act, London; Franklin, the patriot, signing the Declaration of Independence, Philadelphia; Franklin, the scientist,

[1]This department for this issue is devoted to items on industrial education.

electrical experiment with his kite; Franklin, the philanthropist, opening the first subscription library, Philadelphia; Franklin, the diplomatist, signing the treaty of alliance with France, Paris; Franklin, returning home, received with acclaim by the people.

This year an evening industrial school has been organized in Boston under the direction of the State Commission of Industrial Educaton. It is located in the Mechanic Arts High School with the provision that branches be maintained during this year in Charleston, East Boston, Roxbury, and in the Warren Avenue School. A principal is in charge of the central school and all its branches with the work in the various branches under the direct care of a competent assistant. Next year the new part of the Mechanic Arts High School will be ready for occupancy and the entire evening industrial school will be carried on in that building where a fine equipment will be available for its use.

The Lawrence Industrial School opened October 19th with a registration of 900 male and 600 female students. It resumes its classes with good prospects of another successful year. This school was established under the industrial school act and opened last year with evening and day classes for those already engaged in the trades. The school provides for Lawrence and vicinity a means of educating in a systematic manner their large number of textile and metal workers. No entrance examinations are held and no tuition is charged, the only qualification being that the applicant be an operative. William H. Dooley, the principal of the school, has made an extensive study of industrial education in European countries and the instructors are practical men, working in the industries and conversant with the needs of the operative. The problems, drawings and notes come from the shop and the equipment is such as to keep the school in close touch with the industries. The equipment includes up-to-date woolen, cotton and steam machines valued at over $32,000. Classes are carried on in the following subjects: Woolen and worsted spinning, woolen and worsted weaving, woolen and worsted finishing, dobby and jacquard weaving, cotton spinning, cotton weaving, loom fixing and loom calculations, mill arithmetic and mill bookkeeping, elementary and advanced textile design, elementary and advanced cloth calculations, industrial and commercial electricity, steam engineering for firemen, steam engineering for engineers, arithmetic for firemen and engineers, blue print reading, machine drawing and arithmetic for machinists, shop arithmetic, industrial and commercal chemistry, experimental and practical dyeing and dressmaking for working girls.

Smith Agricultural School and Northampton School of Technology is a new school opened at Northampton this fall. More than sixty years ago the sum of $30,000 was left by Oliver Smith, which was to be allowed to accumulate for sixty years. The fund now amounts to over $300,000. This school has been established with money from this fund and is to be maintained by $10,000 from the Smith fund and an equal amount from the State, the plan of the school having been approved by the Commission on Industrial Education. The school admits boys and girls over fourteen years of age and there is no tuition except

as provided by the industrial school law for pupils coming from other localities within the State. The purpose of the school is to provide manual training in agriculture with a view to practical and profitable farming; in household economy, with a view to efficient and enjoyable housekeeping and home-making; and in mechanic arts, as either a foundation for desirable apprenticeships in the cases of boys who enter at fourteen years of age, or as a preparation for the work of journeymen or foremen in the case of students more mature. Whatever a public industrial school of such breadth of curriculum and of equal resources, can do, this new school will endeavor to do toward making work more intelligent, better directed, and better done. It is hoped that a practical plan can be worked out for co-operation between the school and farm, the school and home, and the school and factory. R. W. Stimson is director of the school.

There was opened in September at Montague the first agricultural high school of the State. It was organized under the guidance of the State Industrial Commission and receives one half of its support from the State. This town has maintained for years two high schools, one in the rural village center and the other in the manufacturing village of Turner's Falls. It seems quite natural that the one in the rural center should be made into one of the new schools of agriculture that the Industrial Commission has proposed for the improvement of country life. The school is managed by a local board of five trustees elected by the people, the superintendent of schools and the chairman of the school board being ex-officio members. In consequence of the action of the town, the boys and girls of the farming sections will now be given an opportunity to receive practical agricultural training, and among other subjects will be given instrutcion in mathematics, chemistry and physics as related to agriculture, and such shopwork as will enable the boys to obtain sufficient skill to care intelligently for farm machinery and to perform such construction work about the farm buildings as will inevitably be of advantage to the prosperous farmer. The girls will be given, among other studies, courses in domestic science, home economics and such agricultural subjects as floriculture, poultry raising, greenhouse work, and other lines within the physical ability of women. The boys, upon graduation from the school, will have received sufficient academic instruction to enable them to enter the agricultural college or the normal schools, and the girls to enter the normal schools of the State.

John Burnham Brown, a millionaire contractor of Chicago who died recently, made provision in his will for the establishment of a school for higher business and technical training in Ipswich. This is the town of his birth and the home of his ancestors since the middle of the 17th century. Mr. Brown's two interests in life were business and Ipswich, but the former occupied so much of his time that he could not spend as much time as he wished in Ipswich, thus he was not well known in that town, but in recent years he has been acquiring property in the town and it has now developed that he was planning during his lifetime for this school. The announcement of the terms of his will came somewhat as a surprise to the people of Ipswich. Mr. Brown directed that the

school be called Ipswich Institute and named five trustees that are to have full control in the management of the Institution and property.

The co-operative industrial course of the Fitchburg high school referred to in this department in the October issue is now well started with twenty boys enrolled. Two are working at pattern-making, two are drafting, and sixteen are working as machinists. The boys attend school every other week and work in a shop the alternate weeks. The manufacturers take the boys in pairs so that by alternating they have, at all times, one of the pair at work. Each Saturday at 11 o'clock the boy who has been at school that week goes to the shop and learns on what particular job his alternate has been working and how it has been handled in order that the work may be taken up without delay the next Monday morning. In addition to the regular school work an "Industrial Society" has been organized for mental and social advancement. This society meets once a month and is conducted by the boys themselves. It is planned to have the manufacturers and others give talks of an instructive nature to be followed with discussion by the members, and from time to time a social affair will be given at which no other than members may be invited.

NEW YORK.

The work done along the line of industrial education thus far by the State department has been mainly of a preparatory nature. That is, a circular has been prepared and sent out by Mr. Dean explaining the law under which the work is to be carried on and making clear the steps to be followed by communities desiring State aid in establishing such schools. The circular also contains a bibliography on industrial education and a short list of trade and industrial schools.

Greater New York is evidently not to be left behind in the matter of industrial education, but the fact that Cooper Union, now in its fiftieth year, with an enrollment of over three thousand turned away as many more as it enrolled shows that there is opportunity for further extension of the work. It has been hoped that the work of the Union could be extended this year by utilizing the old Sixty-ninth Regiment Armory, that the city turned over to it last spring, but the building has been found unsuitable for the purpose and work cannot be extended until a new building can be built in place of the Armory or some other building is made available for use. Charles R. Richards, the new director of the Union, is making every possible effort to extend its usefulness.

Another important movement for industrial education in the city is the opening this fall of the Stuyvesant Evening Trade School. This school is under the guidance of James C. Monaghan, who was supervisor of work in a cotton mill before he was fourteen years of age but left the mill to get a college education. He has had a wide experience in consular service, university work, lecturing and in the department of commerce and labor. While in the consular service he made a special study of the industrial schools of Europe and this with his wide experience in this country ought to fit him for directing industrial edu-

cational work in the largest city of our country. The school opened with an enrollment of over four hundred. None of these are in attendance at day schools and in case they are under twenty-one it is necessary for them to bring a recommendation from their employer or some other responsible person stating that they intend continuing the work during the entire year. Instruction is given in carpentry and joinery, cabinet making, pattern-making, blacksmithing, plumbing, machine shop work, printing and typesetting, mathematics, freehand, architectural and mechanical drawing, machine design, applied electricity, steam engineering, electric wiring and installation, industrial chemistry, and applied physics. In additon to these two large schools the work is being extended by the opening of many smaller schools, including a vocational school for girls between the ages of twelve and fourteen in Brooklyn, a school for sales girls in Public School No. 27, and a school for office boys at the Sixth Street Industrial School.

Industrial education has been brought so prominently before the people during the past year, that some believe that nothing of the kind has been in existence in the past. The idea of using public funds for establishing and maintaining such schools is essentially new, but it should not be forgotten that many good schools of this character have been established and maintained at private expense in the past. Many of these have been for the benefit of some special class of people who have had fewer advantages than the average American. Among these might be mentioned the Baron de Hirsch school for Russian immigrants in New York and Hampton and Tuskegee Institutes for colored people in the South. These and many others have been doing valuable service for industrial education under their special conditions.

Eleven agricultural high schools have been established thus far in the State of Georgia. The object of these schools is to fit farm boys and girls for the farm and make them useful citizens of the country. The curriculum of the schools vary and the courses are graduated so that a student may leave at the end of a year or continue for the full course of four years. Provision is made for about four hundred students in each school, the boys and girls both being provided with a dormitory. The students pay five dollars a month for board. This being reduced by farm profits and by the student's work. These schools are not located in towns but on farms of from 200 to 250 acres and half the profits from the farm go to reduce the expenses of the students. The boys work the farm and the girls do the housework. Their work is counted by the hour and the more time they can get for this work the more they can reduce their expenses.

OHIO.

The work being carried on by John L. Shearer in the Ohio Mechanics Institute is to be largely extended. This was made possible by the gift of Mrs. Mary M. Emery of $500,000 which was recently announced.

The new Technical High School at Cleveland opened October 12th, one week behind schedule time, with an enrollment of about seven hundred and twenty-five. All but about two hundred were beginners and about two-thirds

of the total attendance is boys. It is a significant fact that so large an enrollment in a new school has reduced the enrollment in the six regular high schools to a number but forty-two short of last year's enrollment. This seems to warrant the conclusion that the school is meeting a real need in the city.

The Y. M. C. A.'s of many cities have for years conducted evening classes for the benefit of men employed during the day. It is therefore quite natural to find associations taking hold of industrial school work. In Columbus, Ohio, the educational committee of the Association called a meeting of educators, manufacturers and business men to consider this question and as a result money is to be raised to furnish equipment for teaching the following trades: pattern-making, cabinet-making, carpentry, painting, printing, plumbing, telephony and other electrical work.

A co-operative course in mechanics arts is to be started at Lewis Institute in January. It is to be similar to the Cincinnati University plan. As outlined the course is for two years, fifty weeks work and two weeks vacation per year. Twenty-four weeks will be spent in the school and twenty-six weeks in the shop. The students are to be arranged in two groups alternating week by week between the shops and the Institute. The responsibility of the shop training rests with the several employers of the boys, and the responsibility for the instruction rests with the Institute. The age limit for admission is from 16 to 20 years. A condition of admission is the recommendation of an employer to the Institute or the recommendation of the Institute to an employer. The employer is expected to pay five dollars a week for the time spent in the shop and tuition amounting to fifty dollars a year for each boy.

The Portland School of Trades is a school that has been established this year by the board of education of Portland, Ore., and Geoorge W. Hamilton is in charge of the work. One hundred and fourteen students are enrolled in the school as follows: forty-two in electrical construction, three in plumbing, twelve in carpentry, ten in pattern-making, two in architectural drawing, forty-five in machine shop practice. The school is well equipped for instruction in these trades and bricklaying is to be provided for soon. The instructors have all been successful mechanics in their respective lines and the plan is to keep the work of the school thoroly practical. Three-year courses are provided and such academic branches as English, mathematics, applied physics and electricity, and industrial chemistry will be included in the course. Special attention will be given to these subjects as they relate to or have bearing on the trade work. Any earnest, industrious boy who wants to learn a trade as a part of his education and preparation for life is admitted. The school aims to give something more than the mere equivalent of a workshop apprenticeship. Its graduates must have a fair command of the English language. They must know enough of mathematics, drawing and science to insure intelligent, progressive workmanship. Each must become a skillful, rapid and efficient workman in his trade.

A UNIQUE SCHOOL EXHIBIT.

The 1908 exhibit of woodworking done in the Manual Training Department of Teachers College had some features which may be of general interest.

It should be premised that at the beginning of the year, opportunity was given to each member of the senior class, to make for his year's work, a group of projects which should be related to each other. The suggestion was given that

DESIGNED AND MADE BY STUDENTS, TEACHERS COLLEGE, NEW YORK CITY.

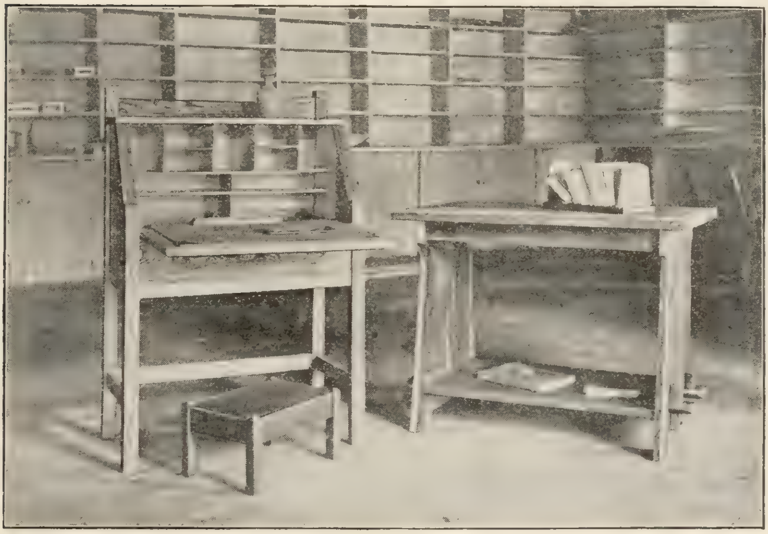
the group was to include a six-sided taboret construction, a drawer, a table, a chair, and a panel construction. After deciding the kind of table to be made, whether a library table, a writing table, a tea table, card table or other table, the table and the other pieces of furniture to go with it were designed, for the most part, in the class of constructive design, and were then carried out in the shop, each group being of the same kind of wood thruout.

The fact that the projects were made in complete groups, made possible an interesting arrangement of the exhibit. One end of a large room was divided into four booths, erected by the students, and each booth held a group of pieces. The decoration and arrangement of the booths was entrusted to the class in interior decoration in the Fine Arts Department, and the friezes and hangings

STUDIES IN FURNISHING A ROOM, BY STUDENTS, TEACHERS COLLEGE, NEW YORK CITY.

were carried out by them, the colors in the woods giving the key notes for the backgrounds. The photographs shown herewith, give an idea of the furniture and the interior decorations.

The results on the whole were very satisfactory. There was an unusual degree of enthusiasm on the part of the students both in making the furniture and in designing and carrying out the wall decorations. Interest in the exhibit was keen and called forth not a little praise. —WILLIAM NOYES.



MADE BY SUMMER SCHOOL PUPILS, WOODSTOCK, VT.

REVIEWS.

Beginnings in Industrial Education. By Paul H. Hanus. Houghton, Mifflin Company, Boston, 1908. 7½x5 in., pp. 200, price $1.00.

This book of eight essays on current educational problems deals especially with industrial education, though it contains a valuable discussion of questions relating to the professional preparation of high school teachers, a chapter on school instruction in religion, and a very interesting account of a week's visiting among the country schools of Bavaria.

As would be expected by one who knows of the work of Professor Hanus as the head of the Massachusetts Commission on Industrial Education, his discussion of the needs of industrial education is of especial value. He does not tear down without building up. He does not condemn the present public school system *in toto* but he shows wherein it has failed to meet reasonable demands in reference to vocational training. He says that the public schools "have been afraid of 'utilitarian' aims, and, sometimes, by a curiously inadequate conception of their real function, they have even measured their own usefulness by the extent to which they have kept the distinctly useful out of their work." By way of illustration of this point he cites the difficulties that have been encountered in getting manual training recognized as an appropriate school subject.

His account of the industrial continuation schools of Munich reveals a type of school practically unknown on this side of the Atlantic, yet one which would be very suggestive to Americans who desire to compete with the Germans in quality as well as quantity of their manufactures.

The author's presentation is strong and deserves a wide reading. —C. A .B.

Notes on Practical Mechanical Drawing. By Victor T. Wilson, Professor of Drawing and Design at the Michigan Agricultural College, and Carlos L. McMasters, Associate in General Engineering Drawing at the University of Illinois. Published by Wilson and McMaster, East Lansing, Mich. 6x9 in., pp. 160. 66 illustrations.

A book adapted to high school or college students beginning the study of mechanical drawing. Minute directions on the proper use and care of instruments and correct methods of drawing are given. Great stress is laid on correct methods.

The book is easily understood and is arranged to hold the student's interest. Perspective sketches are used to show the principles of projection. Geometric problems and line work are reduced to a minimum and practical problems introduced to cover the same ground. Practical problems are given to cover the subject as treated.

This book leads to the making of well arranged, clearly dimensioned, well lettered, readable mechanical drawings and sketches, and if carefully followed, will form in the student good working habits. —F. H. EVANS.

Technical Education in Germany. By Arthur Henry Chamberlain. C. W. Bardeen, Syracuse, N. Y., 1908. 6¾x4¾ in., pp. 108; price 50 cents.

This timely book on the conditions and tendencies of technical education in Germany first appeared as a series of articles in *The School Bulletin.* The book is not an exhaustive treatment of the subject but gives one a general view which is difficult to obtain elsewhere. After giving a classification of the schools, it treats in successive chapters of the continuation schools, industrial schools, higher technical schools, and schools of industrial arts. The volume closes with quite an extensive bibliography. —C. A. B.

International Drawing Congress. Illustrated Handbook to the Exhibition, edited by Keighley Snowden. Published at the offices of the Congress, 151 Cannon St., London, E. C., England. 11x8¾ in.; pp. 108, of which 76 are full page plates from photographs by Reginald Haines; price, 85 cents.

The book includes articles on several of the most famous art schools in England and France, a paper on the "Art Instruction under the London County Council," by A. C. Christie, one on "Art Isntruction in Scotland," by F. Delgaty Dunn, and one on "The Leicester Scheme of Correlation," by B. J. Fletcher. A few Americans will read these papers with keen interest, but every teacher of the arts will be attracted by the excellent reproductions of the photographs of selected exhibits. These indicate that in addition to drawing, painting and design the exhibition included a variety of art handicrafts—wood-carving, metalwork, modeling, inlaying, needlework, printing, bookbinding, jewelry and pottery. Even to see only the illustrations of the work of foreign schools is helpful. —C. A. B.

Report of Committee on Manual, Domestic and Vocational Training. This report was prepared by a committee of the Indiana Town and City Superintendents Association for their November meeting. It is a frank, interesting, helpful discussion of the practical side of manual training from the superintendent's standpoint. It contains three tables giving the most complete data we have seen on the status of manual training and household economics in the schools of Indiana. Of the thirty-eight cities and towns listed, thirty-three report manual training in the grades and thirteen in the high school. Sixteen of the thirty-eight employ supervisors of manual training. In several cases the same supervisor has charge of the art instruction.

Concerning trades the report reads as follows: "The reports indicate that there is no work being done in the State which leads to the trades. It is the judgment of the committee that conditions in Indiana do not warrant the introduction of this phase of vocational work."

The chairman of the committee is Supt. W. A. Jessup, Madison, Ind.

Art Education for High Schools. One of the series of text books on art education published by Prang Educational Company, New York, 1908. 8¾x6¾ in.; pp. 346; price, $1.25.

As stated in the sub-title this book is a comprehensive text book on art education for high schools, treating pictorial, decorative, and constructive art, historic ornament and art history. It is planned upon the basic idea that "art teaching is vastly more important than the teaching of drawing." The book is not a

course of study but it states and illustrates principles which are behind every good course of study for high schools. However, in illustrating these principles exercises are given which in themselves make a good course of study. This is perhaps especially true of the chapters on design, architecture (really a course of fine well selected problems in planning simple buildings), and constructive drawing. The chapter on perspective is especially clear and admirably illustrated as is indeed the whole book. From beginning to end the book is full of good things and whether used by high school pupil or by teacher as a daily guide of book of reference it should help to elevate the character of the drawing and art instruction in high schools. —C. A. B.

Laboratory Arts. By George H. Woollatt. Longmans, Green & Co., New York, 1908. 7½x5 in.; pp. 192; price, $1.00 net.

This is a teacher's handbook dealing with materials and tools used in the construction, adjustment and repair of scientific instruments written by the principal of the municipal technical school at Portadown, Ireland. The book is also intended for the use of "teachers who wish to make a practical contribution to the co-ordination of manual training and science."

The book is divided into four sections. The first is entitled woodworking and treats of timbers, tools, use of tools, exercises in woodwork and finishing woodwork. The second section which is on metalwork, discusses metals, tools and their uses, exercises in metalwork and finishing metalwork. The third section takes up glasswork—cutting, grinding, drilling, bending, blowing, discusses tools and materials and gives a number of exercses. The fourth section gives a large amount of useful information on a variety of subjects; for example, the silvering of glass, plaster casting, electrotyping, the cleaning of mercury, the care of laboratory ironwork, useful cements, French polishing. Many other subjects are included. There are three appendices—the first on the making of lantern slides, the second on optical projection, the third being made up of tables of useful data.

The book is well written, the illustrations are good and it can hardly fail to become a most valuable book of reference to the progressive teacher of manual training as well as to the teacher of science. —C. A. B.

Perspective Sketching from Working Drawings. By Frank E. Mathewson. Published by The Taylor-Holden Company, Springfield, Mass., 1908. 8x5½ in.; pp. 77; price, $1.00.

As indicated in the title, this book is intended to help a student in acquiring the power to translate working drawings into perspective sketches, thus giving him ability to make clear the meaning of working drawings to those who otherwise could not understand them.

As a simple presentation of the principles of perspective for students of mechanical or scientific rather than artistic bent the book makes its strongest plea. One of the devices used, the elliptical protractor, will be enthusiastically received by the boys of this type.

While the power to make such drawings as are shown in this book is of value to every man, it is of peculiar value to the teacher of the manual arts who is constantly called upon to make illustrative sketches. Too few teachers possess the power to do this well. Why should not Mr. Mathewson's book be adopted by the normal school? —C. A. B.

Cosmo Collection. Edited by George Hall Baker, Harry W. Watrous and Will H. Low. Published by The Cosmo-Studio Co., New York, 1908. Complete in ten volumes, each 11x8¼ in.; price, $10.00 a volume.

This collection consists of duotone and hand-colored reproductions of the most famous paintings and sculpture from all the schools of the world. It also includes pictures of masterpieces of architecture, portraits of people of permanent fame, their homes, and associated historic scenes. Each of the reproductions is a full-page plate and on the opposite page is a description of the picture. Volume I, now in hand, contains a brief "Sketch of the Course of Italian Art," by George Hall Baker.

More than seventy-five artists are represented in the first volume, the aim being to make each volume representative of the collection rather than to classify by schools.

The book is beautifully printed on heavy plate paper and the quality of the engravings need hardly be mentioned here because the excellence of the Cosmos Picture is already widely known.

If this collection could find a working place in every school building—not to be kept under lock-and-key, but within the easy reach of children—it would fulfill its mission of helping to popularize the study of great works of art.

—C. A. B.

Art Education in the Public Schools of the United States. Edited by James Parton Haney. Published by American Art Annual, New York City, 1908. 9¾x7 in.; pp. 432; price, $3.50 postpaid.

This is a symposium prepared under the auspices of the American Committee of the Third International Congress for the Development of Drawing and Art Teaching, London, August, 1908.

It contains the following papers: The Development of Art Education in the Public Schools, by James Parton Haney; The Philosophy of Elementary Art Education, by Colin A. Scott; Child Study in Relation to Elementary Art Education, by Earl Barnes; Organization of Art Teaching in Elementary Schools, by Julia Celia Cremins; Art Education in Elementary Schools, by Cheshire Lowton Boone; Art Education in High Schools, by Charles M. Carter; Art Education in Evening Schools, by James Frederick Hopkins; Art Education in Normal Schools, by Harriet Cecil Magee; Art Education in Colleges, by William Woodward; Normal Art Schools, by Jeanette Buckley; Art Societies Connected with the Public Schools, by Frederic Lynden Burnham; Educational Work of the Art Museums, by Florence N. Levy, and Extent and Cost of Art Education in the Public Schools, by George Henry Martin.

Interspersed between the pages of text are one hundred and seven full-page plates representing the best examples of the several types of drawing and art-craft work done in schools of all grades, from the public primary school to the art school.

The first paper, which is by Dr. Haney, is at once the most interesting and scholarly history of American public art education that has been written. It traces its growth from the work of William Benton Fowle in 1821, thru the early period of development in Massachusetts, points to the work of Walter Smith and his associates, emphasizes the importance of the Centennial Exposition of 1876

and its marked effect upon the schools, discusses the several factors that have worked together to shape the more recent work and then sets forth present conditions.

Miss Cremins' paper is the result of an investigation of the conditions in fifty of the principal cities of the United States and aims to show (a) the manner in which art teaching is generally conducted in the schools, (b) the professional training required for elegibilty as supervisor or director of art work, (c) the time given to the subjects of drawing and constructive work, (d) the methods of training the grade teachers, (e) the agencies employed to further art appreciation by the teaching body and the general public.

The same thoro investigation of facts and their adequate presentation is found in all the papers, thus making the book a standard for reference as well as a source of professional pride. Indeed the publication of this book can hardly fail to stimulate professional unity and arouse a national consciousness with reference to art education that has not been evident before. Building on this record art education in the United States should certainly rise to a higher plane.

—C. A. B.

The following have been received:

General Industrial and Trades Schools. Circular prepared by Arthur D. Dean, chief of the division of trades schools, New York State Education Department, answering questions concerning the recent law providing for the establishment and maintenance of general industrial and trade schools. It contains a good bibliography on industrial education.

The Weather Bureau and the Public Schools. By John R. Weeks. Reprint from Yearbook of Department of Agriculture for 1907. Contains illustrations of simple home-made recording instruments.

Constructive Drawing. By Herman Hanstein. Published by Keuffel and Esser Co., Chicago, 1908. 6x8 in., 140 problems, 33 plates. This is essentially a course in geometric problems.

Information and Suggestions. Annual Report of the New York Young Men's Christian Association for 1907. George B. Hodge, secretary of educational department. Contains interesting statement concerning vocational training and its need.

Report of Inspector of State High Schools, Minnesota, 1908. By George B. Aiton. The appendix contains a list of references covering manual training topics, prepared by Harry E. Jackson of Fergus Falls.

A Primer of Wood Preservation. By W. F. Sherfesee. Circular 139 of the Forestry Service, U. S. Department of Agriculture.

Hill Institute, Florence, Mass. Handbook for 1908-1909. Contains illustrations of furniture, metalwork and needlework done by students.

The Utah Educational Review for September. Contains outline of course in manual training for the grades by J. H. Tipton of the State Normal School.

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Manual Training Magazine

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ENGINEERING AND INDUSTRIAL PROBLEMS AS FACTORS IN SEVENTH AND EIGHTH GRADE MANUAL TRAINING.

Albert F. Siepert.

IN these days of the strenuous life every line of human endeavor is being advanced. Specialization has become a necessity. In all industrial pursuits higher quality and greater quantity at less cost is the aim. This same progressive spirit is somehow getting hold of the educators, as magazine articles and programs of teachers' conventions show at a glance. No longer are we content with the three R's; modern needs demand a broader curriculum. The child is now expected to get many times more preparation for life than did his parents in a similar period of schooling.

Coming to manual training courses, we find that here, too, new forces are at work. Slowly, yet surely, changes are coming. Everywhere teachers who really have the cause at heart are at work, each endeavoring to make his course richer and more worth while. They are coming to realize that a new point of view is desirable; that they may not now be doing all their opportunities will permit for the boys under their care; that a development of the present work is needed in response to modern industrial conditions.

Forty or fifty years ago our country was largely engaged in agriculture and kindred pursuits. Cities were comparatively small; our people lived on farms or in small villages. Each boy and girl learned to work, and in a measure, to solve the problems of life by actual experience. But since then—what a change! While we are now one of the greatest of agricultural nations, we are equally great as manu-

facturers. Our cities have grown large and many thousands of our people live by their labors in the factories.

This change of conditions has seriously affected the public school system. In place of the village or country school of our fathers, with but a few pupils, we now have the large city systems. The buildings, equipment, yes, even teachers are far better than in the olden days. But with larger opportunities have come greatly increased responsibilities. Just how to meet these is the question of the hour.

The manufacturer calls for men who not only know the actual tool work of their trade, but men who possess greater knowledge of the whole field of industry in which they are engaged. This means that the workers must be trained by methods different from the old-time apprenticeship system. Time is too short, the field too great, and the apprentice's opportunity in the shop too small for him to acquire the greater industrial intelligence his employer needs. Plainly, then, the schools must solve the problem. How, is still a question.

It is said that schools fail to meet the real needs of the time because they have not taken thought of craftsmanship by which most people must live, and because academic rather than practical ideals have dominated our methods. The criticism that the schools have rather catered to the needs of the boys who will go to college, and forgotten the needs of those boys who from necessity or choice enter the ranks of wage-earners long before they are ready to do so, is doubtless true. When manual training came it was hailed as a means of relief, yet now, many men will tell us that manual training has but just begun to touch the question, that it does not actually fit the boy for earning a living more than did the ordinary curriculum before the advent of manual training. If this criticism has any measure of truth in it, something must be wrong. Manual training must somehow have fallen under the influence of the same ideals that dominate other school work. We realize how this may be true when we recall that it was only a few years ago that leaders in the manual training movement made most strenuous efforts to convince the public that manual training was not trade teaching. So well did they do this that the practical man of to-day has sometimes concluded that manual training has very little in it of real, practical value for use in every-day life.

At the same time, a feeling has been growing among the teachers of manual training that something better than the present affords is not only needed but possible. Ask the boys of any average class concerning their work, and too often their answers will give you excellent food

for thought. You discover, perhaps, that all the models you have required them to make are not interesting to the boys because they are too far removed from the world in which boys live. And if you will critically examine these models you must often be forced to admit that they really have but little in them to appeal to a real, live youngster, and they do not tend to educate him in the things essential to good workmanship, or in a broader way, to prepare him for modern industrial life. The boy has a chance to do too much without thinking enough about what he is doing, and so gets but little good out of his work. He is not being prepared to fill the need of the time which demands men who can not only work with their hands but can think at the same time.

With this view point made clear, the purpose of this article shall be to present a study of engineering and industrial problems in the manual training work of the seventh and eighth grades in order to determine what use, if any, we may make of such problems in the work of these grades.

As soon as one begins the study of the question he finds that many teachers are giving their attention to it. As in every new field of thought, views differentiate widely. Yet in the main these views may be roughly classified under the following heads:

First: We find one class of teachers who make a study of the local industries the most important thing in the manual training. Factories, etc., are visited so that the pupils may observe at first hand the processes of modern industrial life. Handwork is only a secondary consideration in this scheme. Accuracy of result is not an essential thing, as long as the child gets a broader conception of industries as he finds them about him.

Second: We find other teachers who lay special emphasis upon a study of primitive industries in order to more easily lead up to the highly complex modern conditions. This scheme likewise gives less consideration to handwork than it does to the historical and informational side of the processes or industry.

Third: We find still other teachers who are trying to solve the problem by beginning with the boys' own interests. The kind of problems taken up by these teachers are such as appeal to the boy; they bear more or less direct relation to the life with which he is familiar; they offer an opportunity to come in contact with the problems of modern industrial life. Good handwork is desired and accuracy of results is deemed esssential. To be successful in this type of instruction means

that the teacher must be thoroughly acquainted with his pupils both in the schoolroom and the larger life the boys live out-of-doors.

It would seem that one of the first essentials in a study of this sort is the laying down of certain principles which shall govern the manual training work as a whole, irrespective of any classification of the study of industries:

Firstly: At no period of a child's life is it more essential that he acquire good technique than while he is in the seventh and eighth grades. Up to this time he may have had a variety of materials and processes to deal with in order to gain a broader acquaintance with his environment, but now, if ever, comes the time when he is ready to learn the proper way of doing things. No one would expect an old man to learn the art of playing the piano as easily as a boy of twelve or fourteen, nor would the man be able to acquire the same degree of skill that is possible to the boy. Is it any more reasonable to expect to find the hands of a man as obedient to his will in the handling of tools and materials if he has not been trained to use his hands in his boyhood days?

Secondly: If we expect the pupil to acquire good technique we must demand a higher degree of accuracy in result than is found in much of our present-day manual training. If a problem or process is too complicated to get well-constructed, accurate results, one of two things should be done—either simplify the problem or get something else in its place. Nothing can be more disastrous to good craftsmanship than teaching pupils to do work by methods inferior to the best practice, and setting the standard of accuracy below that set by any good workman.

Thirdly: The problems worked out must involve a wide range of thought, must stimulate the right kind of interest, and must give practical training to the pupil. The thought side must be given emphasis if the work is to amount to anything; without it the pupil can gain very little of the industrial intelligence the time demands. Interest is necessary, for without it proper application to the problems in hand is impossible and the desired results unattainable. Such training must be afforded the boy through the doing of these problems that he will have acquired something of value to him in meeting the problems of life. It matters little just what particular problems the teacher may select so long as he is sure that he is taking his class toward this higher goal. Problems suited to one school might be wholly out of place in another, yet the principles of fundamental importance would apply in all cases to a greater or less degree.

Fourthly: These problems should be worked out in materials which are at least somewhat familiar to the pupils. Good results can hardly be expected if the teacher will continually introduce new mediums of expression before the child has learned the proper use of the old. Perhaps no greater good can come to boys than to learn thoroughly those materials nature has placed nearest to the community in which they live. After that, there is time enough to look for those things which come from places new and unfamiliar.

Having thus briefly considered the question under discussion, let us look at some of the limitations which will influence the carrying out of a scheme of manual training along the lines indicated. Local school conditions will largely determine just how far one may go. The first consideration will be the shop equipment. Few shops accessible to pupils of the age and grades we are dealing with have anything beyond the regular equipment for woodwork. This prevents doing much in any material but wood, yet an ingenious teacher aided by a group of interested boys can often work wonders. Many problems possible to these grades require small metal fixtures, etc., which will occasion only slight inconvenience to the resourceful teacher..

But the element of time allotted to manual training is a matter not so easily taken care of. Every grade teacher is jealous of the hours she has with the pupils, and the shop teacher is often crowded to the wall in the scramble for time. It will not be possible to carry out many problems during any one year if the pupils have only an hour or so per week; hence it behooves the teacher to have a carefully planned course. We do not mean by this a course cut-and-dried, consisting of certain models that must be made by all, but rather a plan of the ground to be covered and the information the pupils are to receive in a given period of time.

Another factor is the size of the class. Some teachers will handle thirty with more ease than another will half that number. But in general, a class should not exceed twenty-four nor be smaller than fifteen or sixteen. For the sake of economy the teacher should have plenty to do, but for the sake of the pupils—which is of far greater importance—each child should receive enougn personal attention from the teacher. Unless this element of personal contact has a chance to come in, the highest measure of success is not attainable with even the best of teachers.

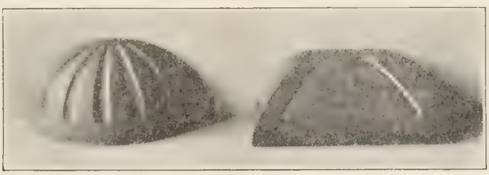
The question then comes as to the method of procedure—what system shall be followed to secure the most satisfactory results? Shall the class be taught by the individual system, or is the class to receive most of

the instruction as a group? These questions can be answered by the individual teacher only after he has made a study of the conditions under which he must work. If he decides that the pupils are to work out individual problems, he can well give all general instruction to the class; then by means of blue-prints, sketches, etc., help each individual pupil as his needs may require. But if some subject is to be developed as a class problem, each pupil must first make a study of the subject for himself; the teacher must have the whole scheme carefully planned out in order that each pupil may get all there is in the subject for him. The actual handwork must be so allotted that each boy has something to do suited to his ability. Then he must be impressed with the importance of doing his part exactly as the drawings specify. Unless this be realized the project will not mean much to the class, and the finished project be hardly worth the effort. Thus it is plain that a class problem presents difficulties not encountered in the making of individual pieces.

A second factor which must receive consideration as one of the limitations of industrial problems for the use of these grades is local industrial conditions. It would seem that for the small city, at least, no better basis for industrial problems in manual training work could be desired than the industries found in that community. We too often fail to see the value of giving training in that which will in all likelihood become the life work of a large percentage of the pupils in our classes. Even if a boy does not follow the usual course by taking up the work of the men about him—if he is to go to college and enter a profession, this training in the things closest to the lives of the workers of the community can but serve to make him a man of broader sympathies and greater usefulness. In the large cities with a diversity of industries a more complicated problem arises, yet here such work may be done as will relate most closely to the industries of that section of the city in which the pupils live.

To summarize, this article has tried to show that if present manual training courses are not doing the most that can be done for the pupils, a change is not only needed but is quite possible. Several methods of procedure are open for the teacher to follow, each depending upon the view he takes of the question as a whole. Certain principles, however, must be observed in doing work of this nature—(a) A definite plan must be made by the teacher that he can carry out; (b) technique must be acquired; (c) the principles of good craftsmanship must be observed; (d) and the standard of accuracy in finished results must be kept up to what any good workman would set.

In conclusion, no form of manual training is doing the most for the pupil if it does not give handwork the first place. It is learning *by* doing, not merely having a little *doing* because the learning may be made more easy or interesting thereby. A study of industries both primitive and modern is valuable, but just as soon as that study becomes the thing of greatest importance and the handwork merely the secondary motive, manual training is robbed of its most vital force. Industrial history or commercial geography would seem to provide more appropriate places in the curriculum to study industries and processes as such, while the field of manual training in the upper grammar grades is fundamentally quite different. Manual training can and does make use of many facts relating to industrial materials and processes, but in doing so it should not lose its identity as manual training. If this proper relation is kept, the handwork of the seventh and eighth grades can become one of the most helpful of school activities in the preparation of the pupil for whatever may be his calling in life..



DOOR STOPS DESIGNED AND MADE BY STUDENTS AT BRADLEY POLYTECHNIC INSTITUTE.

A TOURNAMENT WINNER. FIG. G.

THE CONSTRUCTION AND FLYING OF KITES.

CHARLES M. MILLER.

KITE flying dates back to very ancient history. The Chinese, both children and grown people, have been flying kites for ages. In this amusement the people of China and Japan are unquestionably far ahead of us in many respects, but judging by the progress made in two years by the boys of Los Angeles, California, it may be safely predicted, that in a short time we may expect to see some wonderful aerial crafts of Yankee invention that will far excel the Oriental.

Kite making and kite flying has received a great impetus the last few years as the result of the efforts of some of the boys who have "older grown." Men of science have found some very practical uses for the frail structures of the air. These men have not only performed certain experiments by mens of kites, but have developed considerable aerial craftsmanship. All these developments have been of decided advantage to the small boy, for boys keep their eyes open and are apt scholars when interesting possibilities come their way; so they are no longer limited to the English bow-kite with its long suspended tail; they have turned kite-surgeon, and amputated this appendage.

The kites of to-day are more scientific and more difficult of construction as well, but when a boy sees they are possible to construct, and that other boys have constructed them, he is tempted to try. "What an-

other boy has done, I can do." It is an old saying, and one not sufficiently used, "It is good to put temptation to work in the boy's way." In kite making the boy has an incentive to do some good, hard, original thinking in working out plans already prepared, and as he works on these, new suggestions, vague perhaps at first, pass before his mental vision, which he pursues, sometimes to failure, but very often to successful construction and operation.

All boys who have had some experience in kite flying probably know that

> It takes the wind to make the kite go;
> Just how, they don't quite know.

Without going too deeply into the physics of the various problems of kite construction, the consideration of a few of the simpler ones may not be out of place. If a boy undertakes to fly a tightly stretched, plain-surface kite, he will soon find he has about as foxy a problem as he wants to tackle. He will soon discover that he needs ballast, but the ballast needed is not mere weight. A piece of lead suspended to a string will not answer the purpose—will not give poise to a darting kite. It finds its vertical position too quickly. If we had a very steady breeze, we might work out the right attachment of bridle, and add just the right ballast here and there to make a partial success, but we must consider cross-currents, whirls and calms, and all such disturbances that a boy encounters in all kite-flying. The boys use a tissue paper tail for ballast. The tail steadies the kite, not so much by its actual weight, as by the pull due to the resistance it offers in being drawn through the air. It takes much longer for a tail of this kind to drop to its normal position and is a constant balancer during that time, being sufficient to carry the kite through a temporary disturbance, or to the adjustment of a contrary breeze. It is the same principle as the one employed by the rope walkers who poise themselves by the use of fans. So much for kites with tails.

The tailless kite must have some recompense for the loss of its tail, and this is to be found in its construction. Instead of the tight-covered surface, the cover is put on loosely, Fig. A. The cross piece of the frame is bowed, and this throws the vertical stick, called the spine, well forward. The projection of the spine to the front, forms a ridge on the front surface, like the keel of a bird, and may be likened to the keel of a canoe, also. The first canoes were hollowed out of logs and were round on the bottom. Such a one would soon leave the uninitiated on the wrong side—the under side—but later there was a keel extending

down deep into the water which gave greater poise. Just so with the kite. The boat is not square to the front or to the rear, so the tailless, the best of all flyers, tapers at the top and bottom. The keel is sometimes projected straight out from a flat surface, Fig. B. Kites with keels will ride a rather turbulent atmosphere, and very soon recover their equilibrium. Box kites have vertical or oblique surfaces that keep the kite in poise without the assistance of tail or special keel.

What makes the kite rise? The same thing that causes the windmill to turn; and this is true with a box kite, as well a plain one. The windmill fan turns at an angle to the breeze, and the surface of the kite

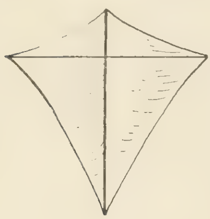


FIG. A.

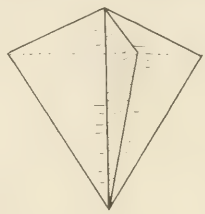


FIG. B.

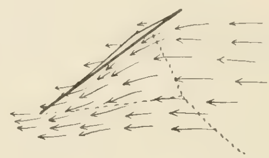
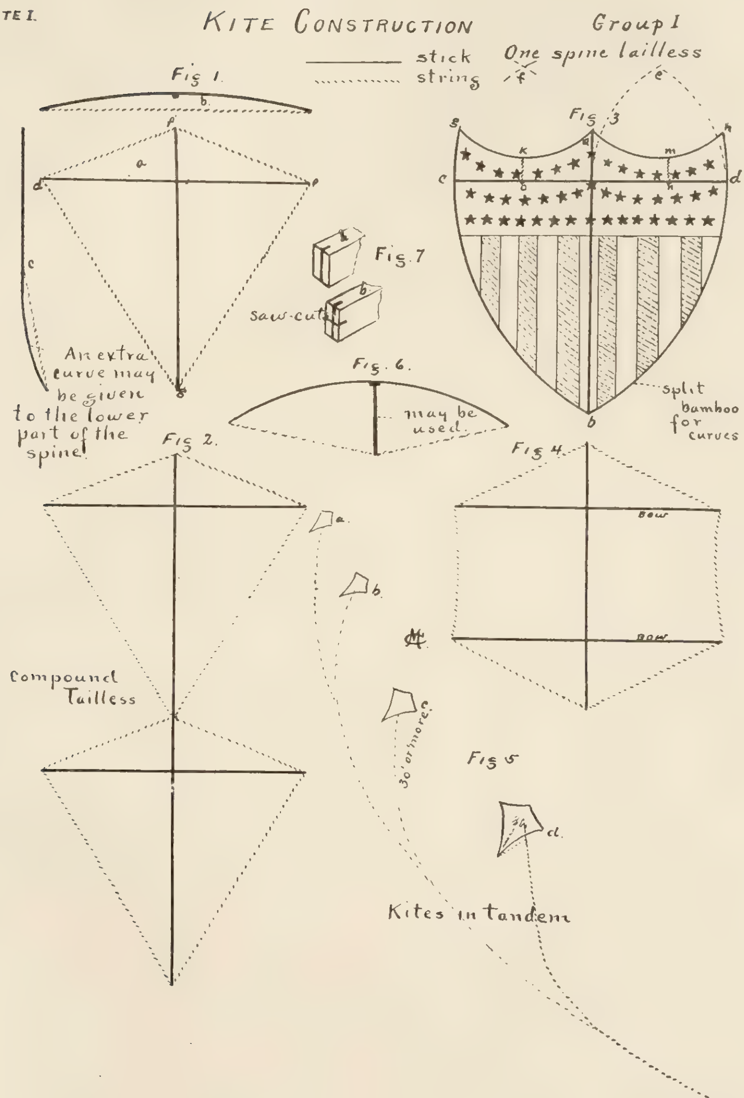


FIG. C.

does the same. Fig. C will help to demonstrate this principle. The air in moving against the kite, has a tendency to push the obstacle out of the way, and would carry it on away with it but for the fact that there is usually a boy attached to the other end of the anchor line. The air must then get by some way, as there is other air pushing from behind. The attachment of the bridle is such as to throw the upper part far forward and so cause most of the air to escape by the under route, as shown by the congestion of arrows, Fig. C. But the thickening of the arrows has a double meaning: it means compression, and compression means resistance; but that resistance is nearly all on the under side of the kite and is just so much more of a lifting force. The force of gravity has all the while to be overcome, but in addition to the lifting power, if the kite is not well balanced, the air will pass too much to one side or the other, and if the bridle should not be well adujsted the kite will dodge and dive and cut up antics sufficient to try the most patient. One boy tried to make a "Foxy Grandpa" kite, but he said the grandpa proved so foxy that he would stand on his head. It lacked poise somewhere.

The secret, then, if it may be called a secret, lies in the proper shaping and balancing of the kite in its construction, a proper tilting of the kite's surface to the breeze, and the use of keels or balancers sufficient to give additional poise in times of special disturbances.

PLATE I.


Kite Construction
Group I
One spine tailless
stick
string
Fig 1.
An extra curve may be given to the lower part of the spine
Fig 7
saw-cut
Fig. 6.
may be used.
Fig 3
split bamboo for curves
Fig 2.
Compound Tailless
Fig 4.
Bow
Bow
30' or more
Fig 5
Kites in tandem

The framework, which is usually made of wood, should be light and tough. Some frames have been made of aluminum tubing. Sometimes a light wood of large dimensions is preferred to heavier wood of smaller size. Spruce is considered a very satisfactory wood, but yellow pine, basswood and white cedar are very good. In the large-sized kites, bamboo is excellent, but split bamboo for body construction lacks sufficient stiffness; it is very serviceable, however, in bending for forms, but not for bows in tailless kites. In California the boys use a three-foot redwood shingle, called a "shake." It is of uniform thickness and is split into sticks about $\frac{7}{16}$ or $\frac{1}{2}$ inch in width.

In the plain kite, the sticks should be lashed together with string, as nailing weakens the stick. In lashing two pieces together, they should be wound diagonally in both directions, with a few rounds between the sticks and around the other windings, to tighten the whole lashing. See Fig. D.

The covering is a very important part of the construction, not only in the material used but in the way it is put on. Probably more kites are covered with tissue paper than any other material. If a good grade of tissue paper is used, it makes a very satisfactory covering for our Southern California breezes. There is a great deal of difference in the grades of tissue paper. A much stronger paper is the Japanese or Chinese rice paper, which usually has to be pasted together, as it comes in rather small sheets in this part of the country, although it is possible to get larger sheets. With large tailless kites, a network of string is sometimes strung over the surface to be covered, to give support to the paper. For box kites and large surface plain kites, lining cambric is very serviceable. It comes in all colors, is inexpensive and durable. Some prefer silk, and some don't, because it squeezes the pocketbook too hard. A flimsy covering is not as good as one with a little stiffening. In drawing on the cloth cover, care must be taken to avoid getting the goods on the kite too much on the bias, as there will be more sagging on one side than the other. (For folding kites see the bibliography at the end of this article.)

The string is an essential part, for if the string breaks—!! For small kites of about three feet a four-ply cotton string is about as good as any. A well twisted cotton string is much to be preferred to a hemp string. The seine twine, running from 6 ply to 72, is a very serviceable kite-line. For very large kites, small rope and wire are used. The string should be about twice as strong as the kite usually pulls in order

to meet emergencies. Remember your string is as only as strong as its weakest point, and a string soon loses in strength if it is allowed to get wet—more so, if it is not thoroughly dried afterward.

Fig. 7 of Plate I, shows the best way to let in the string at the end of the sticks of the framework. A saw is used to make the cuts, as the knife is liable to split the wood. Directions for stringing a tailless kite might be of value here. We will present our framework with two pieces lashed together, the bow in the middle, the spine at one-fifth the

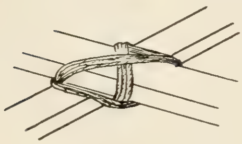


FIG. D.

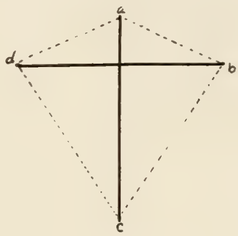


FIG. E.

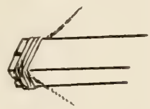


FIG. F.

distance from the top, and with the saw-cuts as indicatd above at the end of each stick. Start by tying string around top of spine at a, Fig. E; pass around b, c, and d. Draw it fairly tight through a and tie again. Now, b in this illustration is a little higher than d. This should not be so. We now measure and make ab exactly equal to ad. As soon as they are equal, take string and wind securely b and d. See Fig. F. Now measure and secure bc and cd, for the spacing of ab and ad will not necessarily bring bc equal to cd, as the spine may be bent.

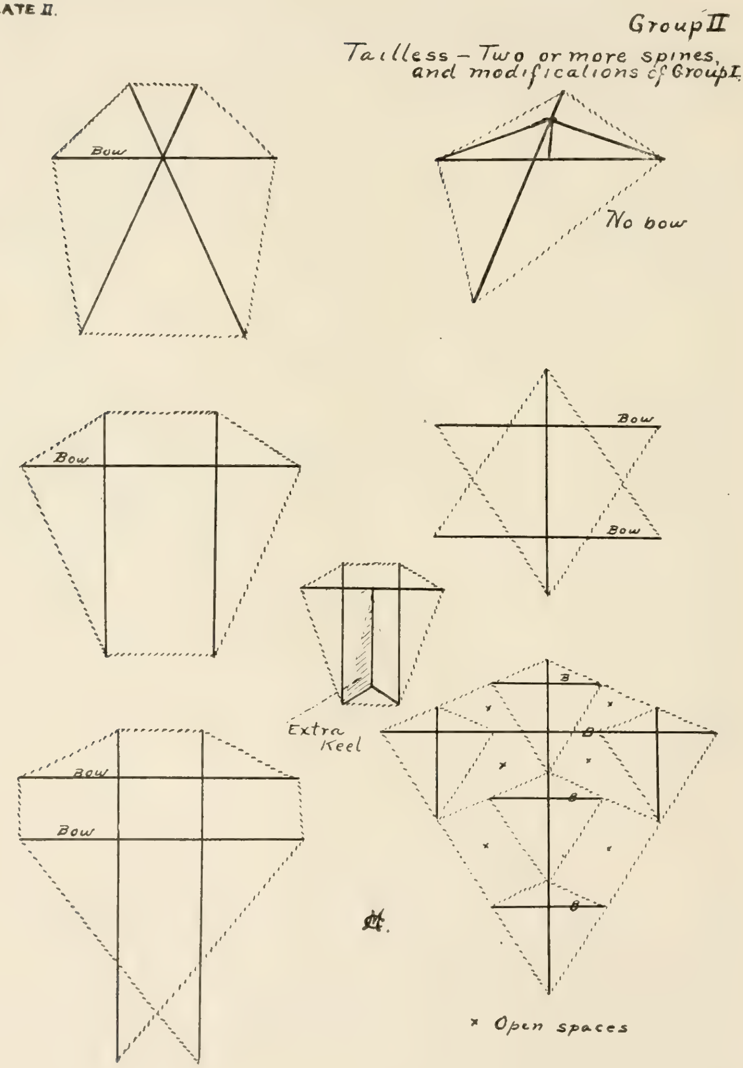
Some kind of a classification of kites seems necessary before taking up the modes of construction. We will first separate them into two general classes, each large in itself:

A. Plain-surface kites.

B. Box kites.

A can be subdivided as follows: (1) kites with tails, (2) tailless kites, (3) figure kites. B may be divided thus: (1) square or rectangular, (2) triangular, (3) cylindrical, (4) tetrahedral. It is possible to combine not only the A and B features, but each may be used in tandem, as shown on Plate I, Fig. 5, or they may be compounded, as shown on Plate I, Fig. 2, and Plate II, at the lower corner. Constructions belonging to kitology, but not exactly kites in themselves, are the messengers, parachutes, signaling devices, wireless aerials, photographic apparatus, and many other appliances.

PLATE II.


Group II
Tailless – Two or more spines, and modifications of Group I.
Bow
No bow
Bow
Bow
Bow
Extra Keel
B
B
B
B
Bow
Bow
× Open spaces

PLAIN-SURFACE KITES.

1. Kites with tails have a representation in the group on Plate III. The English bow-kite was quite a familiar figure to our fathers. The construction is simple and can be easily understood from the drawing. (The horizontal stick may be omitted.) The tail is long and is made of short pieces of paper folded or rolled up, and tied about the middle with the string of the tail. A piece of cloth usually is found on the end.

The star kite, Plate III, admits of considerable variety. The cover may extend over the entire figure, making a hexagonal kite, or may cover just to the string shown by the dotted line, and both may be made, with or without the fringe. Again, each point of the star may be of a contrasting color, or there may be a star within a star.

The star and crescent is a production of one of the school boys. A crescent frame is made of split bamboo; two sticks of the star are long enough to cross the crescent, giving strength to the whole structure.

The five pointed star kite also has three sticks of equal length. They must be securely lashed together at the point of crossing. The horizontal stick can be bowed a little to good advantage. A further development of this kite would be the addition of a light circular band around the outside for the support of a fringe, which should add much to the beauty of the structure.

The kite considered the most artistic by a very competent set of judges at last year's tournament was a large six pointed star kite with fringe, and smaller stars of contrasting colored papers on the inside. The tail was made up of a graded series of duplicate kites, running down to a small one at the tip end. See photograph, Fig. G.

The Japanese rectangular kite shown at the top of Plate III is made entirely of split bamboo. The vertical and two oblique sticks should be heavier than the horizontal. The two tails are of heavy cord (twisted cloth can be used) with long tassels on the ends.

The circular kites need little explanation, but the horizontal sticks should bow a little—the upper one more than the lower. The small circles of the lower kite should extend a little beyond the large circle in order to allow good lashing. If the card board discs used on the tails are not sufficient balancers, they can be made double. See Fig. H.

Before leaving this group, we must consider the bridle. Let us show the attachment of a bridle to a hexagonal kite. See Fig. I. Take a string long enough to reach from b to c with enough slack to reach out about half the height of the kite away from the kite. Attach another

of equal length to a and d. Bring the two strings together at e about one-fourth of the distance above the center, and attach the kite-string at this point. See that a e is the same length as b e.

FIG. H.

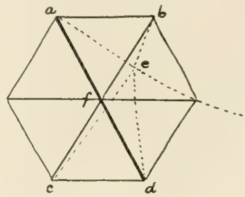


FIG. I.

The Japanese unite a great many points in their bridle, but all must be attached to the kite string—or anchor line—above the center. The five-pointed star kite would have a little different bridle. The bridle string from the top of the two sticks would meet two strings from the lower end of the same sticks, and be attached to the anchor line above the center of the kite.

Two anchor lines are sometimes used for the purpose of performing kite tactics in the air. Two separate bridles are then necessary, and instead of crossing, would extend from a to c and from b to d in the above illustration. The two strings must be played out equally until the kite is well up, then by skillful manipulation many beautiful tricks may be attempted.

Don't cast aside a kite just because it has to have a tail. The fox is said to be proud of his tail. Surely many kites are made more beautiful by the trailing of a long tail, but when two long graceful lines float out parallel to each other, you get a very pleasing effect, as they sway back and forth in the varying breezes.

2. Tailless kites are most popular with the boys nowadays. They cannot fasten the pieces together and attach bridles carelessly with hope for success, but each operation must be carefully measured and worked. The tailless is a very easy flyer and works well in tandem, or may be compounded. The bridle is sometimes attached to the two ends of the spine; sometimes the upper end is attached where the bow and spine are lashed together, but should be made long enough to reach from the top to the end of the bow, and from that to the bottom. In Fig. 1, Plate I, fdg is the length of the bridle. The anchor line is attached to the point that just reaches the end of the bow.

Fig. 2, Plate I, is a compound kite of two tailless. It has one long spine and two bows. The bridle will be attached at the crossing of the upper bow and bottom of the spine.

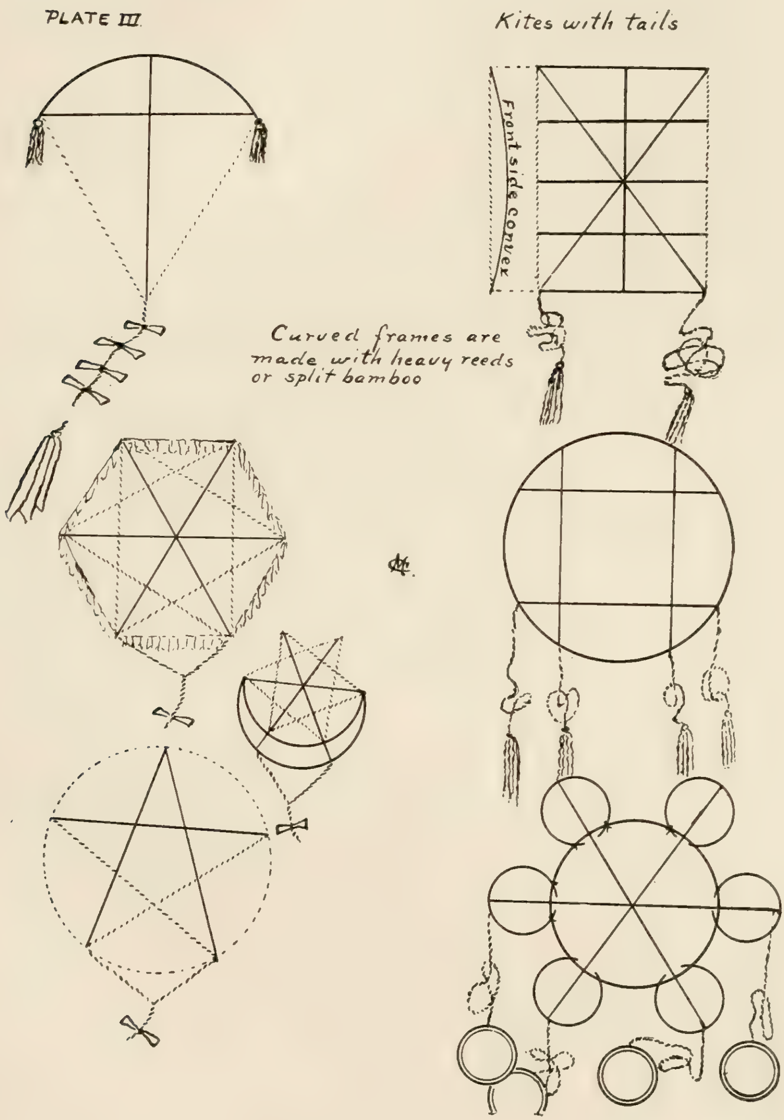


PLATE III
Kites with tails
Front side convex
Curved frames are
made with heavy reeds
or split bamboo

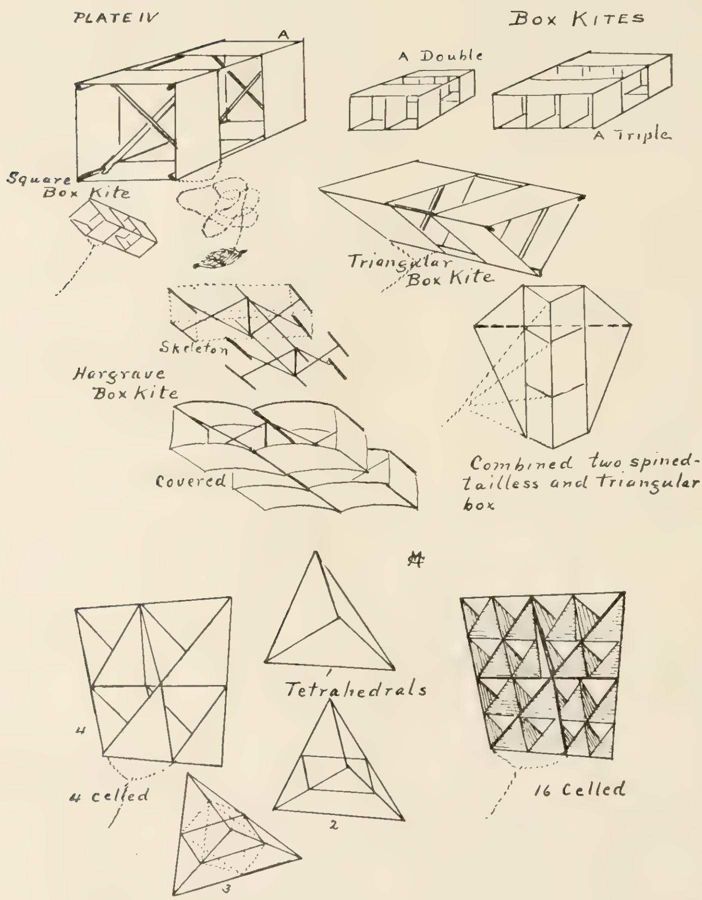


PLATE IV
BOX KITES
A
A Double
A Triple
Square Box Kite
Triangular Box Kite
Skeleton
Hargrave Box Kite
Covered
Combined two spined-tailless and triangular box
Tetrahedrals
1
2
3
4
4 celled
16 Celled

Fig. 3, Plate I, makes a beautiful kite and flies well. The curves g c b and h d b are made of split bamboo and are fastened before a k g and a m h are put on, but when the latter are attached, the strings at m and k draw them down into the upper curves.

Fig. 4, Plate I, with one spine and two bows, is one of the strong pulling tailless kites. The tailless kites as a rule are not strong pullers. The lower bow of this kite should not be bent quite as much as the upper. The spacing is as essential in this, as in Fig. 1. The bridle may be attached in different ways. A loop from one end of the upper bow to the lower end, with another string from its exact center to the lower end of the spine, is a very satisfactory attachment.

In flying the tandem, as shown in Fig. 5 of the same plate, the drawing says 30 feet or more for the extra line of each kite, but an hundred feet and upward is much better. First put up a kite on the main line some three hundred or more feet, then put up a No. 2 on an extra line about 100 feet or more, and tie this to the main line. Let the line out until the second is 300 feet or so away, and attach the third, then the fourth, and so on. Kites can be put up to a great height in this way, for the second, third and so on, lift the string and allow No. 1 to mount higher, which it will do as soon as it is relieved of the load of string.

Plate II is self-explanatory. The three to the left are small boys' modification, and should have a very loose covering. The middle one on the left-hand gave some trouble one day, so an extra keel was added that gave poise and made a strong puller of it. The illustration is given a little to the right.

A small boy came to me one day with a broken heart, and it was all because another boy had broken the bow of his kite. A few encouraging words soon brought back the smile, and a little manipulation brought out as good a sailing kite as there was in the neighborhood. The result is shown in the upper corner. The bow was broken in the middle, so an extra stick was lashed to the back, as shown, leaving the spine well raised.

The large compound kite has no very great advantage over other forms, but is an interesting experiment.

3. Figure Kites. Fig. 3 of Plate I is a beginning of a modification of this class. The construction of figure kites is one of the most interesting developments on the amusement side of the whole problem, but it is also the most difficult, unless tails are used; so whether tails are shown in the illustrations or not, they probably will be needed. Spe-

cific directions or comment cannot be given to each, as it would be as unlimited as nature itself; so a glance at a skeleton here and there will be as much as we can accomplish. Much of the detail must be brought out with dark paper cut to shape, or by the use of a brush. A framework that comes nearest to the center line may be best in some cases, while in others the object will be, to approach the outline. Sometimes a figure is pieced out with a piece of stiff paper to carry some small detail of the outline, but much more is done by a skillful running of string from one part of the framework to another.

The suggestions for the boy kite on Plate V was found in D. C. Beard's book. There are two books by this author that are very worthy of recommendation—"American Boy's Handy Book," and "The Outdoor Handy Book." Many interesting figures are worked out in kite forms. The two books named should be in every home where there are restless boys.

The boy kite can be modified to suit the occasion, but he is not any more obedient in the flying, at times, than some other boys are with their duties at home. The bridle should be attached to the wrists, ankles and top of the head. Each arm stick should be securely lashed to both leg sticks also to the arm sticks where they cross each other. Reed is used to form the outline of the head, hands and feet.

Some very pretty butterfly kites have been made. Here is a chance for some good observation in nature study. A little different method of pasting is necessary here, as it is impossible to get the irregular outline by turning over the edges, so a strip is pasted over the string to the back side of the cover, see Fig. I, thus securing the string to the cover, at the same time leaving the irregular edge free. This hint will be useful many times, so stow it away. The body of the butterfly can be made of a stiff piece of paper. The antennae of light wire or small reed. A light yellow butterfly with dark markings makes a showy kite. The reverse is also true.

The owl may be made of tan paper with dark brown markings. The two horizontal pieces should be bowed, and if carefully made, the kite should fly without a tail. The bridle should be attached to both ends of the spine and both ends of the upper bow.

The bat will surely need a tail, for he is too broad for the height to balance without one. Apply the bridle at a b c d.

The beetle is so near like the owl that it will not require separate attention.

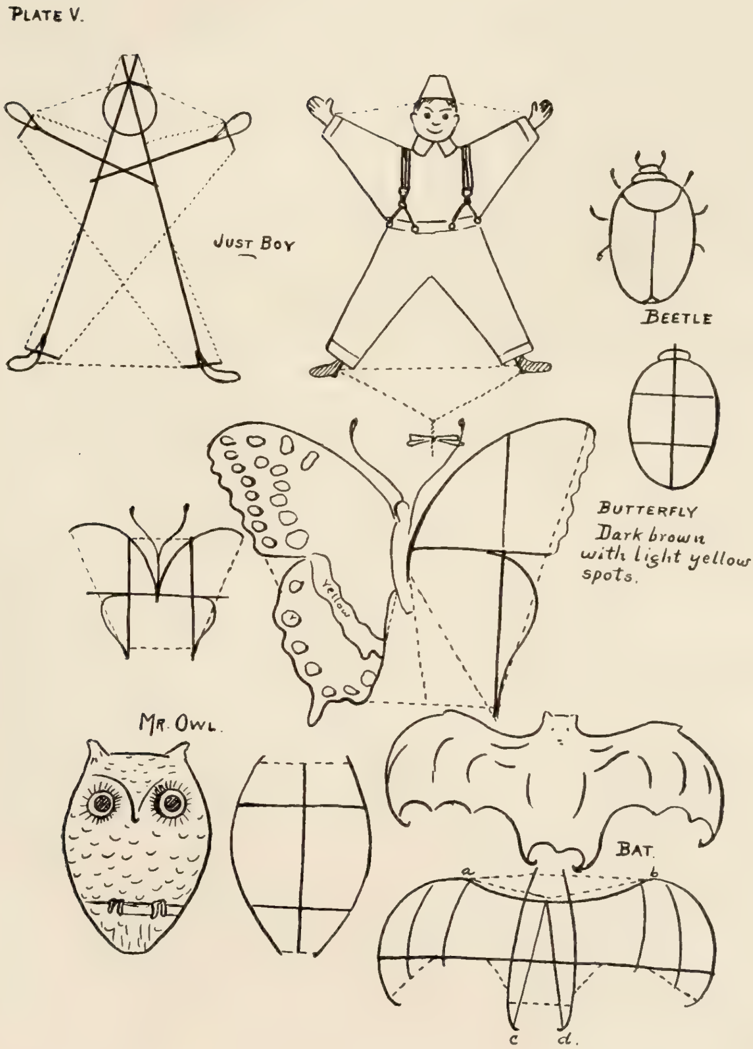
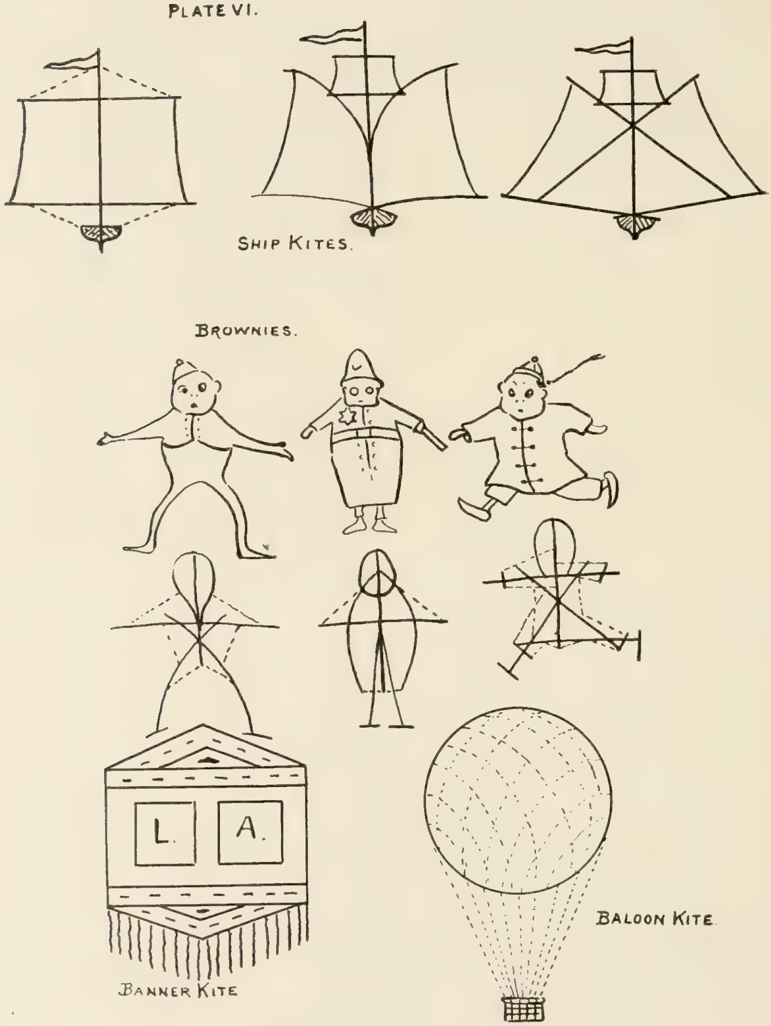


PLATE V.
JUST BOY
BEETLE
BUTTERFLY
Dark brown with light yellow spots.
Yellow
MR. OWL.
BAT.
a
b
c
d.

PLATE VI.



The ship kites with white sails and dark hulls, Plate VI, are very beautiful. The one to the right is about the construction given in the "Outdoor Handy Book," by Beard. I believe it will be possible to construct these carefully enough to fly them without tails. The tails should be in the shape of anchors when used.

The brownies make interesting kites, but like Foxy Grandpas, are hard to fly.

The construction of the banner kite is the same as Fig. 4, Plate I.

The construction of the balloon kite is given on Plate III. The basket and cords take the place of a tail. The balloon should be dark color. This has never been tried to my knowledge, so he who succeeds with it may send word to the writer, 512 S. Boyle St., Los Angeles, Cal.

BOX KITES.

The second general division has more than ordinary interest these days, as out of this group has been developed the most important of the air ship inventions. The latest air ships are kites of large dimensions, combining compound box and plain kites with the addition of propelling apparatus.

Reference to Plate IV should convince one that there is ample opportunity for variety in this class, too, the square or rectangular being perhaps the most familiar. The square kite is only square in cross section. It consists of a light framework of four long sticks, one in each corner, running lengthwise, and four short ones used as braces. Two bands of paper or cloth surround the kite, one at each end, with an open space between them. It is necessary to have these open spaces as air vents. The band and space enclosed is called a cell. The braces are fitted in about half the depth of the cell. The brace should be cut to fit the corner piece, as shown in Fig. K. The winding is to prevent splitting when the kite is suddenly wrenched by a whirl of wind. A good size for the long sticks is $\frac{3}{16}$ x $\frac{1}{2}$ x 34 inches set diagonally in the corner as shown in Fig. K. The braces should be just long enough between

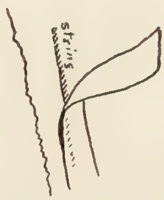


FIG. J.

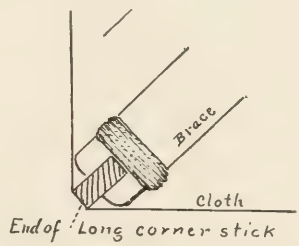


FIG. K.

notches to necessitate their being sprung into place. Shallow notches should be cut in the long sticks to receive the braces. The covering we will suppose to be of cloth, the kite to be 16 inches square. It will require a strip 64 inches long plus 1 inch for seam. The two edges should have a ½ inch hem, and the cell should be 9 inches wide; so to allow for the two hems, the strip would need to be 10 inches. If paper is used, it should be turned back like a hem and pasted down with a string inside to give strength to the edge. The cloth or paper should be glued fast to the outside edge of the long sticks. We start with two sticks first as shown in Fig. L, when dry the two sticks can be brought together, and the other two glued as shown in Fig. M. This gives an even spacing that otherwise would be hard to get. Such a kite can be rolled into small space and is very serviceable. It is easy to see that directions cannot be given for all the box kite class, but many articles have been writen on this phase of the subject, and by reference to the bibliography, no great difficulty should be encountered.

FIG. L.

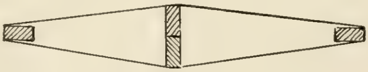


FIG. M.

The triangular box kite can be compounded to quite an extent, but the tetrahedral has been developed by Dr. Bell until it can be made of any size, which is not true of other box kites. Some of the aeroplanes have a number of square cells in a series, with a number of adjustable planes for guiding purposes.

The making of box kites requires more real construction, and their lifting power is greater.

DRAGON KITES.

I cannot leave the kites proper without mentioning the dragon kites. They are a series of plain surface kites. The Chinaman devised a set of harness to make a lot of single kites pull together. They are not compounded, and not in tandem, but belong in a class by themselves. The connecting string, traces, or whatever they may be called, at the top and side and sometimes at the bottom should all be the same length between kites, so that when the head is tipped to the proper angle, all the sections of the body will be inclined the same amount. The Chinese dragon kite has discs for the body kites, but a very successful plan was adopted last year by using tailless kites throughout. The head can be some

larger with the lower part of the covering (best of cloth) left loose and longer than the kite, like an apron, which blows back in the breeze like a beard. For this reason it is cut in irregular shapes. Very light splinters of bamboo with tassels of tissue paper on the ends, extending a few inches to the outside of the kites, can be used as balancers. These should be very carefully spaced. A dragon kite with a 3 ft. head and 2 ft. body kites, will prove very satisfactory. All the way from 6 to 15 body kites may be used with about 2½ ft. spacing between kites. The tail piece may consist of a rod about the width of the body kite, with streamers floating out behind. It will require a sturdy boy or two to operate such a monster. See the "American Boy's Handy Book" for the Chinese dragon kite.

The centipede kite is about the same in construction.

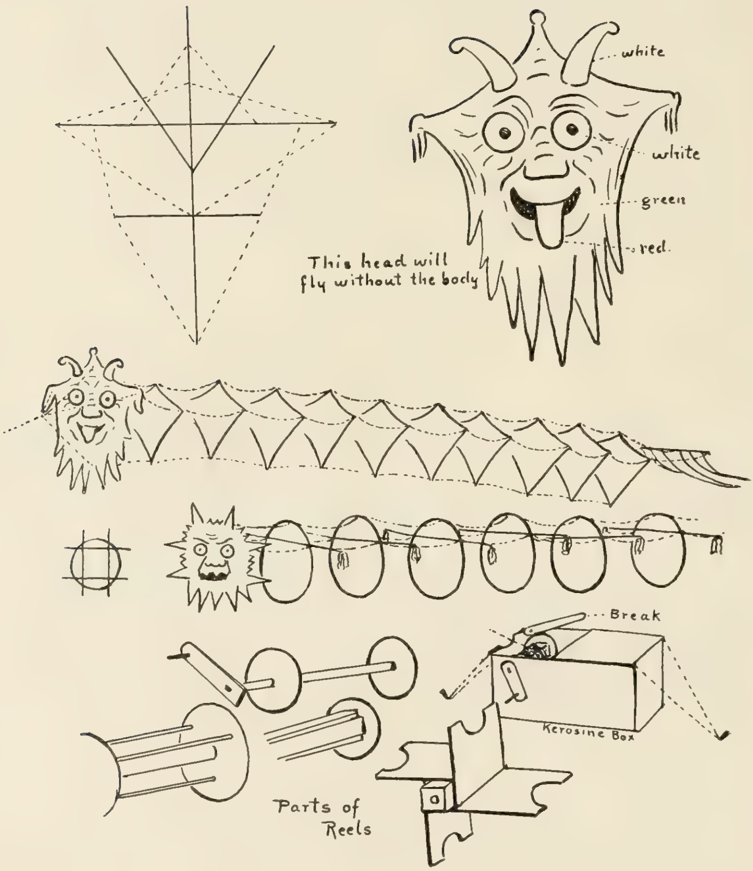
The drawings of reels should require no special direction. A broomstick makes a very good rod, but it is not large enough in diameter for the drum, so this must be built up.

The signaling and experiments in photography have been well set forth in articles given in the bibliography. Two photographs here presented, Figs. N and O, show what was accomplished by a lad twelve years old with a kodak on a kite string.

FIG. N. FIG. O.

The "Yacht Race in the Clouds," by Nugent in *St. Nicholas* for October, 1900, should inspire any boy to work hard to win success, but it is no easy matter to make a successful yacht. We used a little different mechanism last year for our yachts, but there is still room for improvement. This year we used a beam for the yacht and a wire nail bent into the shape of a hook for the release of the sail. Some of the boys have attached light elastic, so that when the sail is released it will be pulled down quickly, thus expediting the return.

PLATE VII.


white
white
green
red.
This head will
fly without the body
Break
Kerosine Box
Parts of
Reels

The tournament of 1907 was recorded in the Manual Training Magazine of December, 1907. The tournament of 1908 was a much greater success. Fully five thousand people were present, and the exhibition was worth going to see. All the participants were not registered, but 39 schools were represented, and 216 registrations were made. The air seemed full of kites—big and little, strong and curious. It was a sight to be remembered.

Much might be said about the streamers, messengers, wireless operation, etc., but we will close with just a word on the purpose and plan of the work.

The kite undertaking is encouraged through the schools, but is a home occupation. The construction is not carried on in the manual training shop, but is used as a supplement to shopwork.

The boy uses his knowledge developed in a manual training course in working out his own problems by himself. Mimeograph sheets were posted in each school with drawings similar to those presented here, for use as suggestions. The boys got their ideas, and worked them out during what would otherwise be idle hours. Many mothers have expressed their approval of the undertaking, and many teachers have been able to reach boys through this sport, that they were not able to understand before. The kite problem is seasonal. The tournament is brought about for the purpose of recognizing the efforts and success of the home occupation. There are many similar projects having as great variety as this one, that might be used in a similar way.

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SIMPLIFIED MECHANICAL PERSPECTIVE.[1]—II.[2]

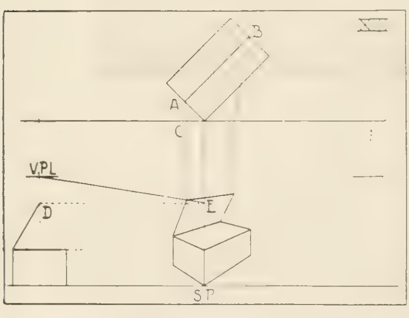
FRANK FORREST FREDERICK.

IT MAY have occurred to those who are working these problems, that the Tr. V. Pl. might be used as H., the points, found by drawing lines at the required angles from S. P., as the vanishing points for the problems, and that the P. L. might be placed as far below Tr. V. Pl. as the eye is supposed to be above the horizontal plane. This is true, and Problems I to VI, given in Part First, might have been so worked, but in this system of perspective—known as the "Plan Method"—where the plan of the object to be put into perspective is drawn, this plan and the working lines of the problem would be confused with the perspective if the picture plane, with H., was not moved nearer the spectator.

Students who have followed these problems should now be sufficiently familiar with the subject to be upon the lookout for "short-cuts" in locating points and lines by means of diagonals, etc., and should learn to distinguish between lines necessary for the complete solving of the problems and lines used only to obtain some required point. It should no longer be necessary to carry all lines out to their vanishing points in order to appreciate their direction, and lines of projection from Tr. V. Pl. to the perspective should be omitted if likely to confuse the problem. If the proper degree of hardness of pencil for the paper used is found, all working lines may be made of a delicate lightness that will permit all to be seen without causing confusion.

Succes in working the following problems will depend largely upon a sharply pointed hard pencil.

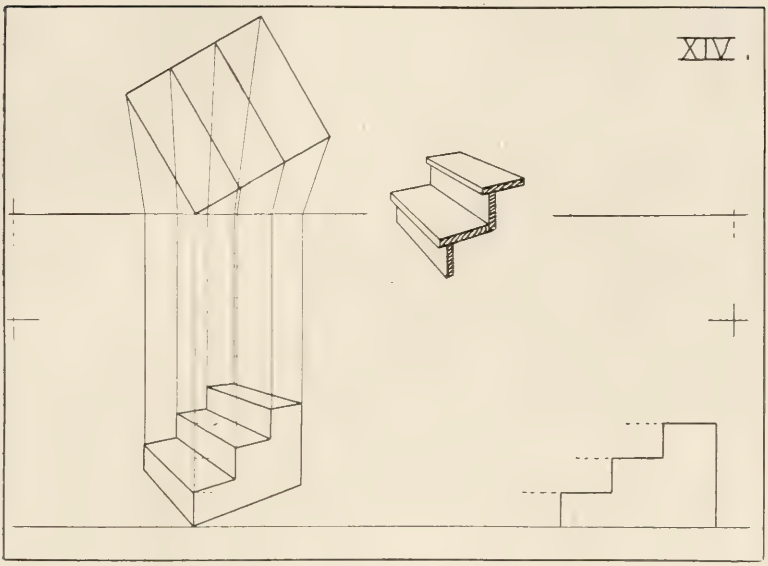
PROBLEM XIII.

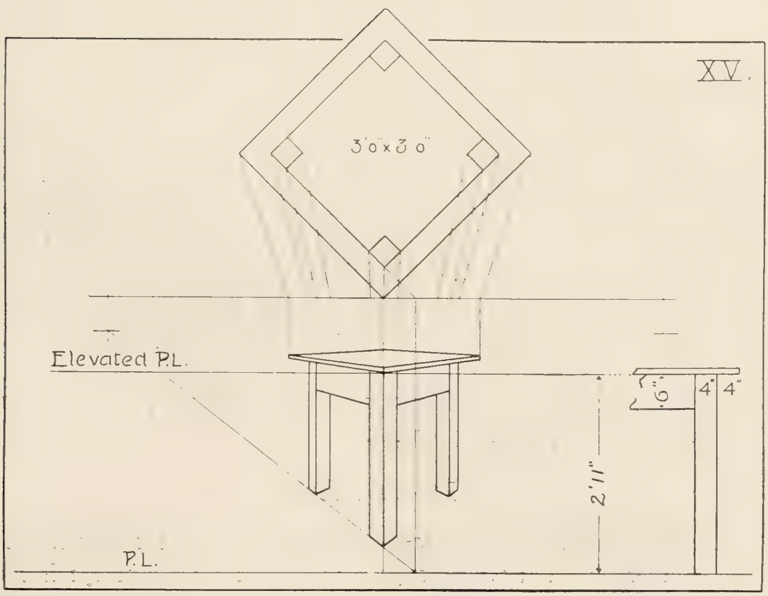


Scale ½″=1′0″. S. P. 11′0″ to right and 1′0″ above. C. V. 9′0″ from S. P., P. L. at S. P., H. 6′0″ above P. L. In this problem a box, 3′0″x5′0″ and 2′0″ deep, with cover open at angle of 60°, is placed at an angle of 45° with Tr. V. Pl. The box is put into perspective as as the prism in Problem VII.

[1] Copyright, 1908, Frank Forrest Frederick.

[2] For Part I of this series, see MANUAL TRAINING MAGAZINE, October, 1908, pages 28 to 39.


XIV.


XV.
3'0" x 3'0"
Elevated P.L.
P.L.
2'11"
6"
4"
4"

The edge of the cover is seen as line A-B in the plan. Drawing a vertical line from C we have a vertical in which the perspective of A will be found. Project point D to E and draw E—V. P. L. Where E—V. P. L. cuts the vertical the perspective of A is found.

The same vertical plane includes the end of the box and the edge of the cover as it opens. Any vertical distance in this plane must be first set off on its intersection with the picture plane (as E—S. P.) and then carried into perspective.

This problem will have but a small part of its possible value to students if it is not followed by a practical problem. Bring a trunk into the drawing room, raise the cover to some known angle, and place the student who is to draw the perspective a certain number of feet, as 8′0″, from the nearest corner of the trunk. The point on the floor under the student's eye becomes the S. P. The distance upon the floor from S. P. to the nearest corner of the trunk (C. V.) becomes the L. of D. The distance the eye is from the floor gives the distance H. must be placed above P. L. Measuring the trunk to get its dimensions, and turning it so that it makes some known angle with the assumed vertical plane, and adopting a scale for the drawing, a perspective should be drawn. S. P., L. of D., Tr. V. Pl., P. L. and H. may be drawn upon the floor with chalk.

If two students work together, and with tape line find the distanes and measurements, problems of this character become more interesting.

Problem XIV.

Scale 1″=1′0″. S. P. 2′9″ to right and 6″ above. C. V. 4′6″ from S. P., P. L. at S. P., H. 3′0″ above P. L. In this problem a set of steps, rise 6″, tread 9″ and 2′0″ long, makes an angle of 30° to the right. In the perspective the width of the treads is obtained from the plan and the height of the risers from the elevation, being first set off on the L. of D., and then carried into perspective by lines vanishing at V. P. R.

Two or three of the lower steps of any stairway provides a practical exercise to apply this problem.

Problem XV.

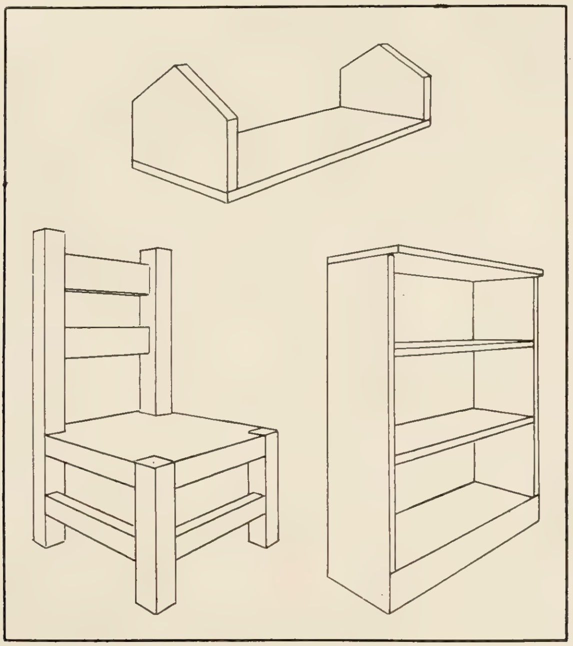
In this problem a table (measurements given on the plan and elevation) is drawn as it would appear to a spectator whose eye is 3′6″

from the floor, and who is so placed that the point on the floor (S. P.) directly under his eye is 4′0″ from the point on the floor directly under the nearest corner of the top of the table.

The statement of the diagram is as follows:

Scale 1″=1′0″. S. P. 5′6″ to right and 3″ above. C. V. 4′0″ from S. P., P. L. at S. P., H. 3′6″ above P. L.

The table top is one inch thick and 2′11″ from the floor. First put the top in perspective by using an El. P. L., 2′11″ from P. L., and then the legs, using P. L. In the location of the nearest corner of the nearest leg on the floor apply Problem IV.[1]



[1] Note to Teachers.—When selecting furniture for students to measure and draw in perspective, care should be taken to select very simple examples, as, possibly, the book-rack or shelves made by the students in the wood shop. (See accompanying illustrations.) If small, these may be placed upon a table which becomes the horizontal plane for the problem.

After students have become familiar with perspective and accustomed to working problems—in other words, when their perspective sense has become developed—they should be assigned more complicated and difficult problems the important lines of which should be found mechanically and the details added freehand.

THE PERSPECTIVE OF INTERIORS.

It is but a step from drawing objects in a room to the room itself. The same principles apply and the method is the same.

Plate III (not to be worked by students) reproduces a perspective drawing of an inglenook the plan of which is shown by Fig. 9. The drawing is introduced at this point in the course to illustrate the method of approaching a problem of this character.

By measuring it was found that a point on the floor directly under the spectator's eye (S. P.) was 12′0″ from the point marked Y in the plan, Fig. 9. His eye was found to be 3′8″ above the floor.

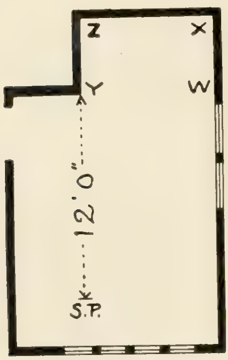


Fig. 9.

The first step taken, in drawing the perspective of this inglenook, was the drawing of the plan. The next step was the location, at the same scale, of S. P., L. of D., Tr. V. Pl., P. L., and H. in the order named. As the eye chanced to be directly in line with the left wall (Y-Z), Y-Z in the plan was continued 12′0″ and the S. P. for the problem was found. S. P.—X (the L. of D.) was next drawn, and Tr. V. Pl. was drawn at right angles to the L. of D. through point Y. The paper was then taken from the board and repinned with Tr. V. Pl. as a horizontal line. P. L. was placed at S. P. and H. placed 3′8″ above P. L. V. P. L. was located by projecting point Y to H., and V. P. R. by drawing from S. P., parallel to Y-W, to cut Tr. V. Pl., and then projecting the point found to H. V. P. R. falls outside the margin line. When drawing perspectives of interiors, students should use large drawing boards, or fasten small boards to the top of tables, to secure room for the vanishing points. These points, when located, can be kept by driving pins into the boards or table. The elevation was then drawn with P. L. as base line.

The important lines in the perspective of the inglenook were obtained from the plan and elevation, but the details were drawn by guess. If the perspective had been drawn at a larger scale (1″=1′0″ was used) these could have been drawn accurately. Architects and designers for interior decoration often, for convenience, draw perspectives at small scale and then enlarge them to any size desired.

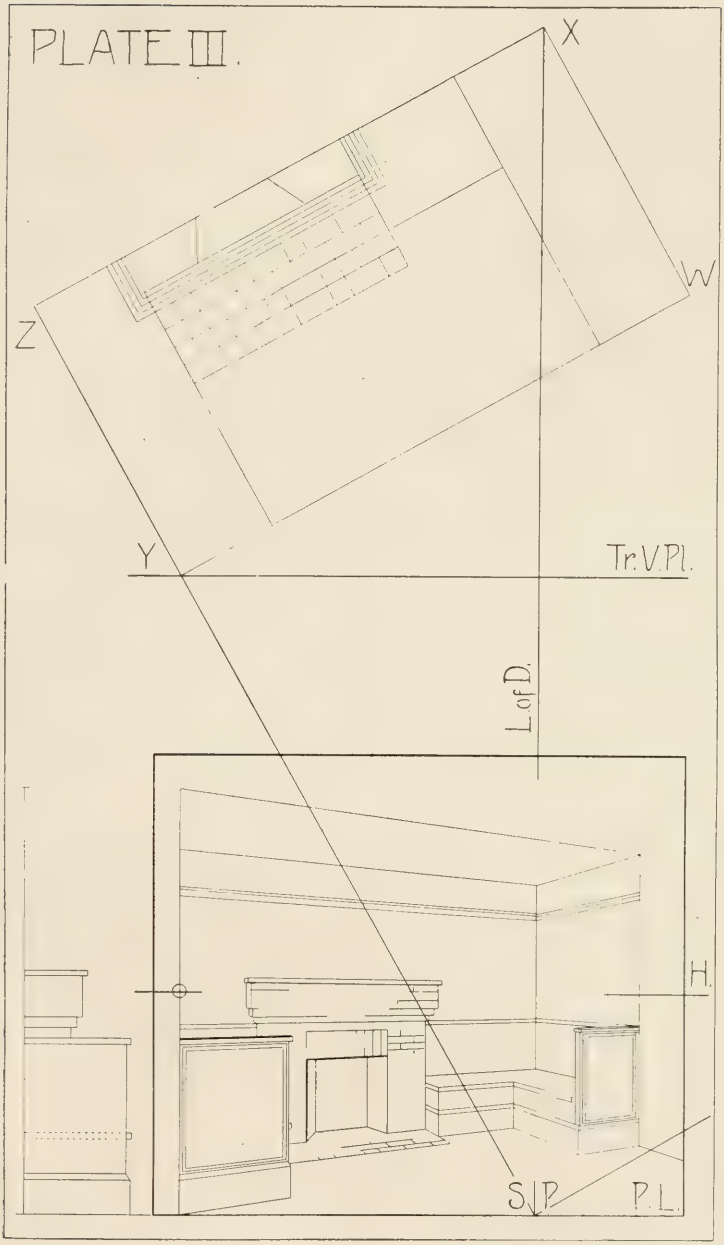


PLATE III.
X
W
Z
Y
Tr. V. Pl.
L. of D.
H.
S.P.
P.L.

If the lines to obtain widths become confusing on account of their number, they can be drawn in sets and each set erased before the next is drawn. In Plate III the set used to obtain the seat was erased before the set used to obtain the fire-place was drawn.

In working perspective problems much experiment is often necessary to get the perspective upon the paper where wanted. If the plan and elevation be drawn and then cut apart and pasted or pinned upon the paper upon which the perspective is to be drawn, much time may be saved as their position may be changed without going to the trouble of re-drawing.

Problem XVI.

In this problem, Fig. 10, a spectator, whose eye is 4′0″ from the

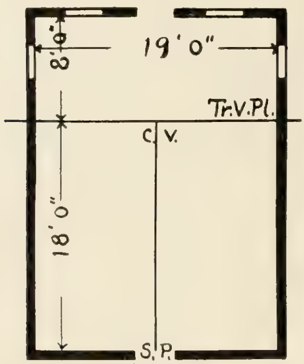


Fig. 10.

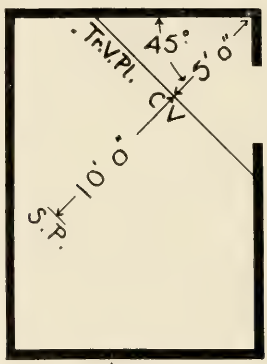


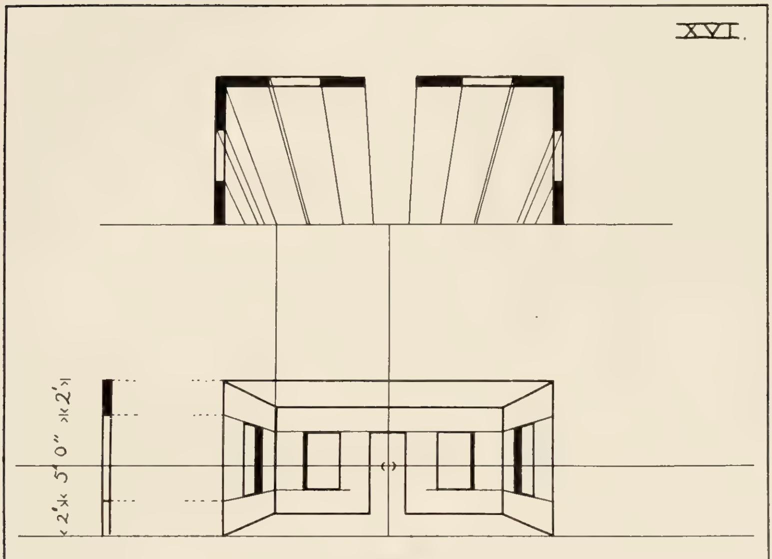
Fig. 11.

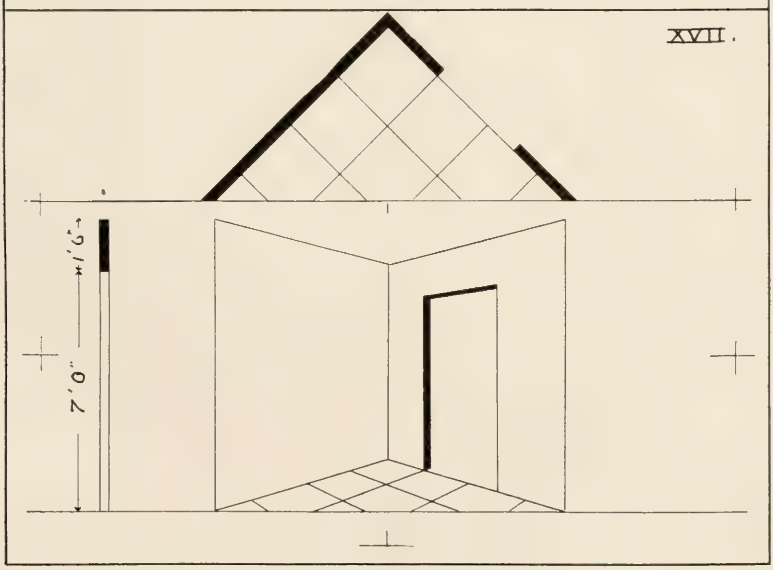
floor, is supposed to be standing in a door at the end of a room 19′0″x 26′0″. He assumes the vertical plane to be 18′0″ from his eye. The perspective represents that part of the room (8′0″) lying beyond the vertical plane. The statement of the diagram will be: Scale ¼″=1′0″. S. P. 22′0″ to right and 3′0″ above. C. V. 18′0″ from S. P., P. L. at S. P., H. 4′0″ above P. L.

Put the room into perspective according to Problem IX, and draw the door and windows 3′0″ wide. The height of the room, the door and windows is shown by a section of the wall of the room.

Problem XVII.

In this problem, Fig. 11, a spectator whose eye is 4′6″ above the floor, is standing 15′0″ from the corner of the room. The Tr. V. Pl.

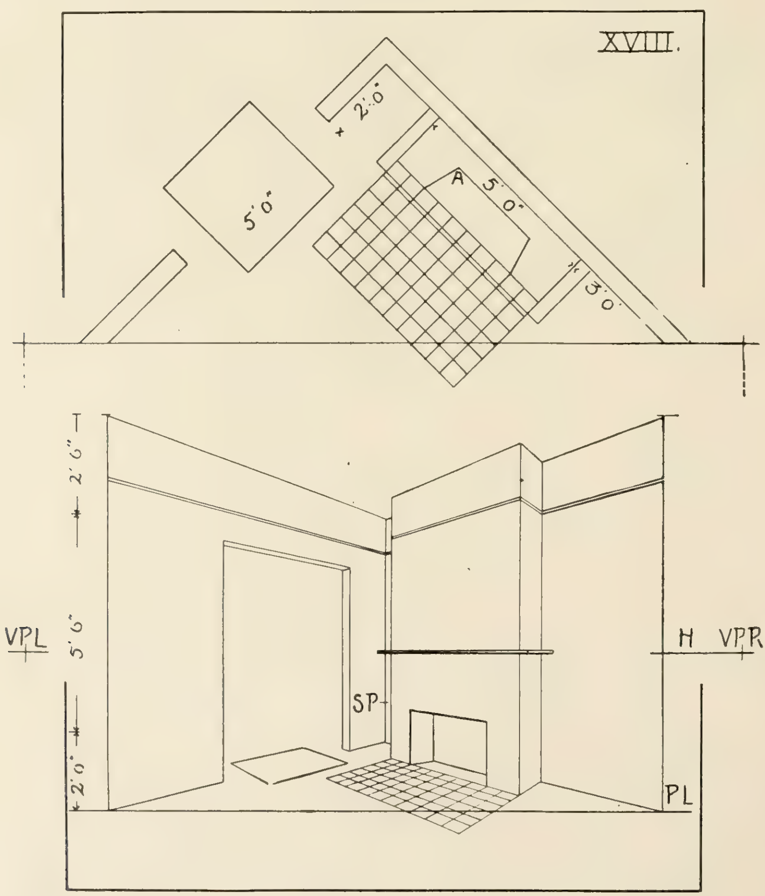

XVI.
2' 5' 0" 2'


XVII.
7' 0"
1' 6"

is assumed to be 10′0″ distant. The drawing represents the perspective of that part of the room (5′0″) lying beyond the vertical plane. The diagram is drawn as follows:

Scale ½″=1′0″. S. P. 11′0″ to right and 6″ above. C. V. 10′0″ from S. P., P. L. 1′0″ from S. P., H. 4′6″ above P. L. The door is 3′0″ wide and the floor is divided into 2′0″ squares.

When drawing interiors, where the distance from S. P. to C. V. is less than the height of the room, P. L. may be placed wherever convenient—above the plan or below S. P., Fig. 12. If H. is kept the required distance from P. L., and the widths are obtained from Tr. V. Pl., the perspective will be the same as if drawn upon a P. L. placed at or near S. P. (See Problem XVIII.)



PROBLEM XVIII.

(For this problem the 8″ side of the margin line is considered as the top.)

Scale ½″=1′0″. S. P. 8′0″ to right and 4′9″ above. C. V. 9′0″ from S. P., P. L. 2′0″ above lower margin line, H. 4′0″ above P. L.

The spectator, whose eye is 4′0″ from the floor, is supposed to be standing 16′0″ from the corner of a room. The vertical plane is placed 9′0″ from his eye. The ceiling of the room is 10′0″ from the floor and therefore P. L. is placed below S. P. The doorway is 7′6″ high, the fire-place opening is 2′0″ high, the tiles are 6″ square and the picture moulding 1′6″ from the ceiling. A rug 3′0″ square is placed in the center of the door and extends through into the adjoining room. The shelf projects 4″ from the chimney breast and is on the level of the eye. Point A is located as point A in Problem V. Part of the hearth is found to project in front of the vertical plane. This frequently happens when designing interiors, and if the projection is not too great the drawing is not seriously distorted. To find the perspective of lines extending in front of the vertical plane, find the perspective of the ends of the lines that are beyond the vertical plane, and continue the lines until they meet in front of the picture plane.

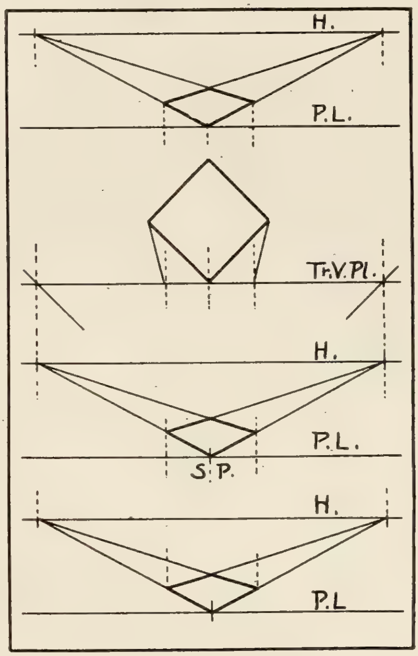


Fig. 12.

After students have worked Problems XVI, XVII and XVIII, they should be assigned ends and corners of rooms and halls to be drawn in perspective as practical problems to apply the knowledge gained. Before students undertake the remaining problems in this series they should be able to draw in perspective any view of any room from any point.

The practice and experience gained in this work is not limited to the actual drawing of the perspective. To measure a room and draw its plan and elevation or section—to decide upon the angle the sides of the room shall make with the vertical plane—to locate, to the best advantage, the station point and the vertical plane, gives an all-round training in mechanical drawing that is quite as valuable to the student as the development of his perspective sense.

Problem XIX.

A student whose perspective sense has not been developed always has trouble when drawing the gables and eaves of houses, and the lines of intersection of chimneys with roofs. Some of our best landscape painters seem unable to handle this really simple problem in perspective.

Scale ¼″=1′0″. S. P. 22′0″ to right and 1′0″ above. C. V. 12′0″ from S. P., P. L. at S. P., H. 10′0″ above P. L.

After drawing the roof, draw the top of the chimney from an elevated picture line as far (5′0″) above P. L. as the top of the chimney is above the horizontal plane.

To find the line of intersection of the chimney with the roof, consider the right side of the chimney as included in a vertical plane cutting the roof. The line of intersection of this vertical plane with the roof is found as follows:

Continue the side of the chimney to point A. Project A to B. Draw B—V. P. R. to find C. Draw C-D, a vertical line, and connect D with V. P. R. Project the width of the right side of the chimney to D—V. P. R. and the intersection of the right side of the chimney with the roof is found.

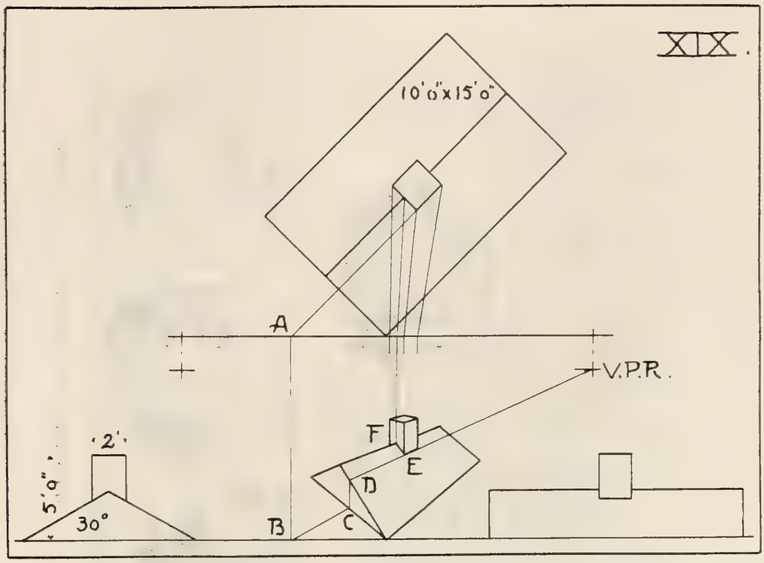
The line of intersection of the left side with the roof is found by projecting the point of intersection of the ridge of the roof with the chimney to its perspective and E-F is found—a short line but quite as important as any line in the problem.

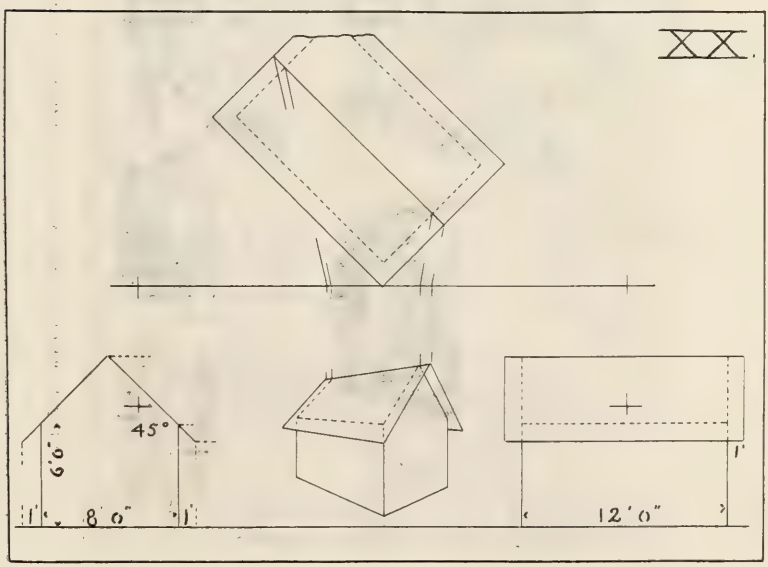
Problem XX.

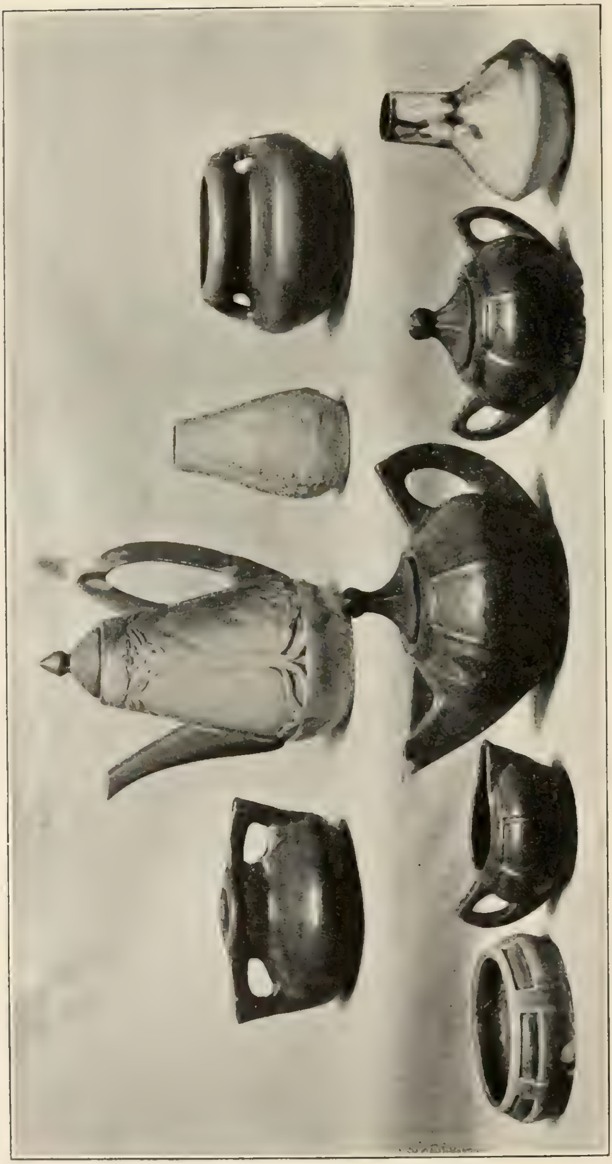
Scale ¼″=1′0″. S. P. 22′0″ to right and 2′0″ above. C. V. 14′0″ from S. P., P. L. at S. P., H. 7′0″ from P. L.

Draw, first, the rectangular prism representing the body of the house and the triangular prism representing the roof. Then draw, from an elevated picture line, the triangular prism, which, with the bases omitted, becomes the projecting eaves and gables.

Part III will be devoted to the perspective of circles.


XIX.
10'0"x15'0"
A
+V.P.R.
2'
5'0"
30°
F
E
D
C
B


XX.
45°
6'0"
1'
8'0"
1'
1'
12'0"



POTTERY DESIGNED AND MADE BY STUDENTS AT THE SCHOOL OF INDUSTRIAL ART, TRENTON, NEW JERSEY.

A COURSE OF STUDY IN MANUAL TRAINING.—VI.[1]

CHESHIRE LOWTON BOONE.

THE first firing of the clay produced what is called *biscuit*. This, according to the character of the clay used and the temperature reached, is a more or less porous terra cotta or brick-like material. Biscuit will not hold water unless burned so hard as to vitrify (begin to melt.) This biscuit for the sake of smoothness, cleanliness and color, is usually glazed.

GLAZES AND GLAZING.

There are three common forms of glaze covering, (a) bright and more or less transparent glaze, (b) mat, opaque glaze, and (c) enamel, also opaque. The bright transparent glaze is the easiest to manipulate and produce, and with it the results are much more sure, being less affected by unskilled handling and firing. Such covering, though it lacks much of the fine texture and quality of other glazes, is most suited to school use and admits of all the variety of color and tone one needs. The mat glaze is a viscous, dense, coating rather difficult to apply evenly and is erratic in the fire, but very beautiful at times. Enamel is practically a transparent glaze rendered opaque by the substitution of 10 to 20 per cent of tin oxide, in the glaze formula. All these glazes can be purchased ready to mix with water and use, but they can be readily and more cheaply made in the school. The manner of doing this will be described later.

APPLICATION OF GLAZE.

Glaze in finely powdered form is mixed with water until all lumps have disappeared. The mixture can be accelerated by means of an ordinary egg beater. The consistency of the liquid depends upon the kind used. Bright glaze, or enamel should be of the consistency of good rich milk, which has not been skimmed; mat glaze should be like good cream, in fact as thick as possible and still give a smooth, even coating when the ware is dipped in it and the surplus shaken off.

The process of coating pottery forms with liquid glaze is a difficult one to learn and still more difficult to describe. In the first place one

should have plenty of glaze—a quart or two in a large, yellow, round bottomed kitchen bowl. Ware to be dipped, is first soaked in water nearly to the point of saturation so the porous clay will not absorb water from the glaze; it is almost impossible to give dry biscuit an even coating because the body takes moisture from the glaze so rapidly it sticks to the surface in lumps.

When thoroly soaked, the pieces should be well dried with a cloth. While still damp each piece, held with the tips of the fingers, touching the surface only at the top and bottom, or in as few places as possible, is dipped in the glaze. It should be first completely coated inside by partially filling it with glaze and washing this about all over the inside surface. The piece should then be rolled over and over in the glaze to cover the outside. Lastly, the piece, held firmly, is turned bottom side up and shaken well to rid the surface of all superfluous liquid. It is shaken bottom up to make the coating of glaze thickest at the top and because most glaze, if a bit overfired, tends to run and if the coating is thickest at the bottom, this running would produce unsightly results. The covering of glaze, if bright, can be made rather thin and will of itself become smooth and of even thickness. Mat glaze must be coaxed and handled with all the care possible to produce perfect ware. If the covering is thin in places, these spots will be bare and unpleasant when burned. After the glazing is completed, each piece is set on a triangular stilt, such as potters use, or as a makeshift, any raised support smaller than the bottom of the glazed piece, so the glaze be not injured; all the glaze on the bottom is to be scraped off when the piece is dry. While the coating is still wet, all finger marks or other necessary imperfections can be repaired with a soft paint brush dipped in glaze.

These glazed pieces should be allowed to dry until they can be easily handled without injury to the coating. Then all glaze on the bottom should be scraped off into the proper bowl and the glaze even scraped away from the bottom rim (or foot) of the piece. Then if the glaze does run a little in firing, it will not run clear off the ware.

The glaze may crackle some in drying which does not matter unless some peels off. If so, a little gum tragacanth in water mixed with the glaze before use, will make it adhere well to the ware.[1]

[1] It is often desirable to mark pieces on the bottom or elsewhere, with the number of the glaze or color. Black oxide of cobalt mixed with clay or Kaolin, half and half, and moistened with water, may be used as a paint for any permanent marking; it will stand fire.

GLAZE COMPOSITION AND MIXING.

Glazes are all a kind of glass, being composed of ingredients which when mixed together and subjected to sufficient heat, fuse to a glassy mass. Bright, transparent glazes are true glasses. So is enamel. Mat glazes may be termed immature glasses and have the spongy crystalline character of slag—the refuse of smelting, but their surfaces possess often beauty of texture and marking. The only glazes of use to the amateur or teacher who have not the conveniences of the potter, are those using lead as a flux. The lead is used in the form of lead carbonate which mixes with water more easily and stays in suspension better than the heavier oxide. Glazes must contain beside lead, silica, the other essential element, and alumina to keep the glaze under control. Other ingredients are added to give fusibility, texture, hardness, etc. Clay (or Kaolin) which is composed largely of alumina and silica, is used freely in making glazes because of its floative power and the firmness it gives before burning. This makes the handling of glazed wares less difficult, when placing in the kiln. The following recipes for glaze are designed to burn at cone 04 or 03, in the oil kiln which is used by most schools.

No. 102/A.—Bright Blue.

Lead Carbonate	142
Whiting	10
Felspar	56
Kaolin	13
Flint	54
Zinc Oxide	12
Manganese Oxide	8
Antimony Oxide	3
Cobalt Oxide	1½

No. 111/77.—Mat—Dark Blue.

Lead Carbonate	148
Felspar	125
Kaolin	32
Whiting	20
Nickel (green oxide)	5
Yellow Ochre	3
Cobalt Oxide	2
Copper Oxide	1

No. 25/1.—MAT—DARK GREEN.

Lead Carbonate	154
Whiting	25
Felspar	83
Kaolin	51
Cobalt Oxide	3
Iron Oxide	6

No. 98A.—WHITE ENAMEL.

Lead Carbonate	154
Whiting	15
Felspar	83
Zinc Oxide	8
Kaolin	12
Flint	36
Tin Oxide	74

In the recipes here given, the ingredients above the line form the glaze proper and those below the line, the coloring element. Other color ingredients might be substituted for those here given, using the same glaze for a variety of colors. The following colors work well with the above glazes:

No. 28.—LIGHT—YELLOW GREEN.

Copper Oxide	1
Yellow Ochre	½
Nickel Oxide	½

No. 78.—OLIVE GREEN.

Iron Oxide	5
Cobalt	½

No. 88.—MULBERRY.

Antimony Oxide	2
Manganese	2
Yellow Ochre	4

The amounts indicated should be weighed out in grammes, put together in a stoneware mortar, mixed with enough water to stir easily and thoroly ground with a pestle.[1] Thoroly means half an hour

[1] All the supplies for pottery work can be obtained from B. F. Drakenfeldt & Co., 27 Park Place, New York, or Roessler & Haasslacher, 100 William St. The mortar should be generous in size—about 8 in. or 9 in. The scales should have good sized pans. Glaze ingredients as lead, felspar, kaolin, flint and whiting should be bought in lots of ten or fifteen pounds. They cost little.

or more till one becomes skillful. The ground glaze may be put into a large, round bowl (labeled) and allowed to settle. Glaze is invariably better if stirred occasionally and allowed to settle before using.

PLACING THE KILN.

When the glaze of freshly dipped pieces is quite dry and the bottoms cleaned off, they are ready for the kiln. Each piece must be quite by itself, not touching any other piece or any part of the kiln or the shelf on which it is placed. Each piece rests directly on a triangular stilt having sharp points which, even if the glaze should become too fluid and run off the piece, enable it to be easily detached from the shelf. Since the ware cannot be packed in closely as in firing biscuit, the interior of the kiln oven is filled with fire clay shelves, supported at the ends by small bricks, and on these shelves the ware is placed.

All parts of the kiln do not receive exactly the same amount of heat, and in almost every kiln there is some place where the glaze does not develop so well as it should. Skillful firing will help to remedy such troubles, but for the most part it is as well to use the colder places in the oven for burning softer glazes, or merely fill them with old biscuit. The oven should be as well filled as possible, to secure even, well distributed heating.

It is not safe however to place glazed ware and biscuit too close together—not nearer than three or four inches. Nor must mat and bright glaze be side by side. In the first place, biscuit placed too near melting glaze is likely to rob the glazed surface of some of its coating, and in the second instance, mat glaze placed alongside of bright, tends to become bright itself.

FIRING THE KILN.

The chief point to remember in firing a kiln is that the temperature must not only be maintained, but increased up to the proper point. The temperature must never be allowed to decrease for a moment. To maintain proper heat, one must so regulate the dampers beneath the kiln that the oil will burn with as clear a flame as possible. During the first half of the firing the oil should be fed into the pan just as fast as it will burn; a pan full of oil is no advantage—rather otherwise. When the firing is finished and the pan burned out, all dampers both above and below should be closed that the kiln may *cool slowly.*

CLASSROOM APPLICATION.

It would be quite impossible in large classes to have all the glazing done by pupils. It is quite important however that they do some of it, that they mix up from time to time the glaze needed, and grind it, and most important of all that they see the kiln placed and during a part of the firing. It is the purpose of this part of pottery making to make clear the technical essentials of an industry and children should see and try each of the steps.

Perhaps one of the most interesting experiments in this connection is the building, by the class, of a small experimental kiln outdoors. This was done in one of the schools in Montclair, N. J. The boys of the class furnished all the labor and fired the kiln, taking turns two or three at a time.[1]

EQUIPMENT.

Aside from the kiln which has already been mentioned, the following items could be included in the equipment for pottery work:

Tables—Any rigid, level-topped table, such as kitchen table with unfinished surface.

Scales—Which will weigh from one to one hundred grammes, costing about $3.50.

One-half dozen large yellow kitchen bowls for glaze.

Stoneware mortar and pestle, 8 in.

Stilts—75 cents per gross.

Pyrometric cones—numbers 07-06-05-04-03-02. Fifty of each. They cost 1 cent each and can be obtained from Prof. Edward Orton, Jr., Ohio State University, Columbus, Ohio.

These ingredients for glaze:

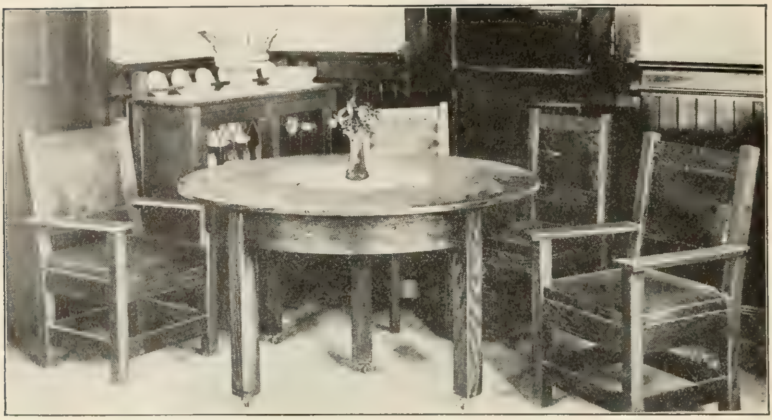
15	pounds	Florida Kaolin.
15	pounds	French flint.
15	pounds	Felspar.
15	pounds	Lead Carbonate.
15	pounds	Whiting.
½	pound	Black Oxide of Copper.
¼	pound	Black Oxide of Cobalt.
1	pound	Red Oxide of Iron.
½	pound	Black Oxide of Manganese.
1	pound	Zinc Oxide.
1	pound	Yellow Ochre.
¼	pound	Oxide of Antimony.
¼	pound	Green Oxide of Nickel.
		Tin Oxide if it is desired to make enamel.

[1] Description of this kiln and details of structure will be found in School Arts Book for May, 1906. Illustration on page 10 of Manaul Training Magazine for December, 1908, shows pots burned in this kiln.

The room should have shelves upon which to place finished work and a closed closet or cabinet with shelves upon which unfinished work may be left, covered with damp cloths. There should be running water. Fresh clay should be kept in a strong wooden box with cover, preferably lined with zinc. The clay should be purchased ready to use, at a cost of one to three cents per pound. The ordinary modeling clay used by sculptors will be found easy to handle, though rather infusible in the fire. Certain brick clays, burning to a buff or brownish red color, are more pleasing. These can sometimes be secured locally.

CONCLUSION.

Although the equipment for pottery work can be secured at moderate cost and the technical processes themselves are not very difficult, they are new. Until recently few teachers have been familiar with the craft and could not find a way to become so. One can learn now. Pottery making is taught in many normal and art schools and this kind of manual training offers just the combination of hand and art training which is needed in the intermediate grades.



FURNISHING A SCHOOL DINING ROOM.

PHILIP S. HASTY.

IN April, 1907, upon the completion of our annex, the room adjoining the kitchen, which had previously been the second grade room, was set apart as a permanent dining room.

The question naturally arose: How shall this room be furnished? The answer came with one accord, from those immediately interested: Have our boys and girls make the things which are necessary, so far as lies in their power, so that the room when completed, will be convenient, artistic and beautiful; so that it will be a permanent exhibit of what may be accomplished through a union of the arts and crafts and through enthusiastic and hearty co-operation between pupils and teacher.

The end of the year being so near at hand it was impossible to begin the work at that time. During the summer a great deal of planning was done by the teacher of manual training and the teacher of art. Some alterations were also made in the size and shape of the room so that when school opened in October 1907 everything was in readiness.

The first ten weeks of the school year were spent, by the boys of the second and third year high school classes, in the work of designing. A study of the room was made and the effect of its size, shape and arrangement upon the character and disposition of the furniture was determined.

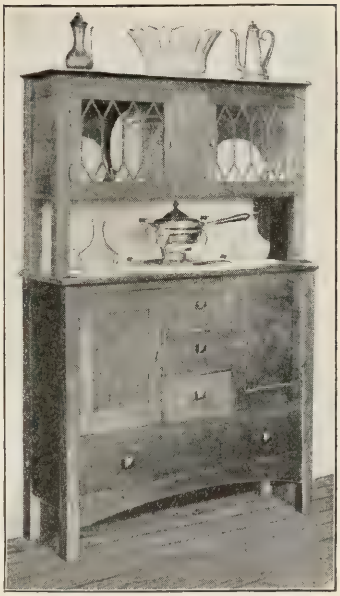
The following pieces were decided upon:

Six side chairs.

Two arm chairs.

One extension table, not to exceed 12½ ft. when open.

One sideboard with china cabinet above. Cabinet to be fitted with leaded glass doors. Width of sideboard determined by width of space set apart for it.



Two serving tables with cabinet below. Doors to match those of china cabinet above large sideboard. Width of these pieces also determined by the positions in which they were to stand.

Material: Quarter-sawed oak.

Style: Mission.

Finish: Dark brown with an undertone of green.

Then began the actual work of designing. Original research in the realm of furniture was required. Visits were made to store and factory to obtain ideas in design and for the purpose of studying typical forms of cabinet construction.

The usual height of chairs, tables and sideboards was studied and discussed. Later an original design in pencil, for each piece, was submitted by each member of the class. From this sketch a working drawing and a drawing in perspective were made and inked. Some of the perspectives were later done in color.

This work was of course competitive, the most suitable design for each piece being selected by a comittee consisting of the instructors in art, domestic science and manual training. Tracings were made from the selected drawings and blue prints struck off. All was then in readiness for the actual construction which began shortly before Christmas.

Commercial methods were adopted so far as possible throughout. The class of twenty boys was divided into five groups and a foreman appointed over each. The side chairs were assigned to two groups, the arm chairs to one, the table to another, and the sideboard to the fifth, leaving the two small serving tables for those who should finish first.

Practically all instruction was given to the foremen, who, in turn, looked after the details of the work.

During the greater part of the year time sheets were kept showing the amount of time spent by the different groups in the construction of each piece.

Class discussions were held during which opportunity was given for the settlement of all disputed points. In this way also the entire class was able to keep in touch with the main points in the construction of each piece.

Present space will not permit a detailed account of the many difficulties encountered, of the many battles fought and won. Suffice it to say that the results, both educational and commercial were all that could have been expected. The year's work was one long lesson in generosity and good will in which each boy did his best. They learned to command firmly without being overbearing, to obey with cheerfulness. Such a course is a maker of *men*.

While this work was going forward in the shop, the dining room was being prepared for occupancy. The woodwork, which had previously been natural cypress, was refinished by some of the larger members of the class to correspond to the furniture, and the floor stained to match. Decorators papered the walls and ceiling, the ceiling being dropped to the plate rail which extends around the room at the height of the door frames.

Lanterns of brass and colored glass were made and hung in place. Thus with the addition of stencilled window hangings in blue and white from the Domestic Art Department, the room was ready.

And so we moved in. Chairs and table arranged in proper place, cabinets and sideboard with their blue china and the glitter of cut glass, the lanterns throwing their light upon the whole, presented to our visitors upon the night of our annual exhibit, a pretty picture of welcome and good cheer which still remains to tell its own story of work well done.

EDITORIAL

Manual Training Exhibits

The approach of the annual meetings of the various industrial art associations suggests the possibilities of exhibits.

It is to be regretted that the manual training exhibits have not been more general in recent years, for if wisely conducted they are a most instructive feature of these meetings. The exhibits of the early days of manual training were overdone. They became ponderous, difficult to prepare and expensive to transport, and consequently fell into disfavor except with schools which could afford to advertise.

As a matter of fact large exhibits are not essential, or even desirable. One of the most thoughtful exhibits at a recent meeting occupied a wall space about two feet by seven feet. In many instances the object seems to be the glorification of the exhibitor rather than the enlightenment of the observer. A mass of material is presented that suggests little relation or purpose and offers very little that is new, and that little is so obscured by duplication and the commonplace that it is found with difficulty, or not at all. Such exhibits become monotonous and tiresome and defeat their true purpose.

The primal object of exhibits at such meetings is to present material involving thoughts that will be helpful to workers. To this end they should be simple and direct, offering quality of thought rather than quantity of material. An exhibit should express the purpose and plan of the work that it represents, illustrated by typical examples, avoiding duplication, and should be sequentially arranged. A most helpful exhibit may consist of a single problem logically developed so that its place and purpose are unquestioned.

Above all an exhibit should be truthful. The highest tribute that we have heard paid to the work of a school system was that it was "honest work." It should be chosen from the regular class work. Work designed and made especially for exhibit purposes is intentionally deceptive and is, to say the least, unmoral in its influence upon the pupil. Work executed by instructors or pupils of a higher grade than credited should be considered as hardly less than criminal. —W. E. R.

GROUP OF OFFICERS AND PROMINENT MEMBERS OF THE NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION.
TAKEN ON THE CAPITOL STEPS, ATLANTA, GA.

ASSOCIATIONS

WILLIAM T. BAWDEN, Editor.

THE NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION.

The National Society for the Promotion of Industrial Education held its second annual meeting at Atlanta, Georgia, Nov. 19-21. The annual banquet was held Thursday evening at the Piedmont Hotel and the regular sessions of the Association were held in the Hall of Representatives in the State Capitol.

The Association was formally welcomed by Governor Hoke Smith and by Mayor Toyner of Atlanta. In the corridors of the Capitol building an extensive exhibit of trade school work was arranged by a committee headed by Prof. Matheson of the Georgia School of Technology.

On Thursday evening addresses were delivered by Dr. Elmer Ellsworth Brown, U. S. Commissioner of Education, and by Pres. Theodore C. Search, Pennsylvania Museum and School of Industrial Art.

UNIFYING INFLUENCE OF INDUSTRIAL ART.

Dr. Brown dwelt on the fact that trade schools or technical schools of any kind should be intimately connected with the general movement of public education. He said in part:

"We shall get a much better system of industrial education in this country if the new movement can be kept in close alliance with our great systems of public schools as already established, than if we undertake to set up an entirely new system that has no part nor lot in the general education movement of our time. The special phase of this subject of which I wish to speak, is the unifying influence which is to be exerted within the next few years by industrial art and by the spirit of art as it is to be found in our general education and also in our industrial education.

"It is difficult even at this day to speak of art before an American audience without seeming to belittle the subject under discussion. We have not yet got beyond the idea that art is something very like millinery. When I speak of the tendency of our time to emphasize the art side of education, what I have in mind is something much more serious and substantial. Art is that part of education which lays emphasis, first, on the excellence of the work done, apart from any extraneous consideration; and, secondly. lays emphasis on good taste in the product of the work. Our modern education has allied itself with modern science. That alliance is to be maintained and extended. But it has begun to ally itself also with modern art, and that alliance is to be one of the most important in the education of the future. It is already so well begun that we may count on it with confidence in the immediate future.

"This does not mean that there should be no distinctive trade schools or agricultural schools, or technical schools of any kind. Such schools, indeed, we

must have. The need for them is imperative. But these special and technical schools must be brought into some intimate connection with the general movement of public education or they will fail. I am confident that they will not fail in the end. But they will win their success by bringing over into their new and difficult work of special training a full measure of that general intelligence and insight and strength of ideals which has made the public schools and the public school teachers of our land so true a source of national pride and power."

MANUFACTURER PLEADS FOR APPRENTICESHIP SYSTEM.

At the Friday morning session the first address was delivered by E. P. Bullard, Jr., of the Bullard Machine and Tool Co., of Bridgeport, Conn., who urged that manufacturers give more attention to training their own apprentices. He said in part:

"It is admitted that we need more skilled men and that some means must be devised for developing the inefficient and unskilled so that they may be valuable to themselves, their employers and to the community in which they live.

"Carefully devised apprenticeship systems successfully operated in the majority of our factories would do much to augment the existing supply of skilled and efficient workmen. They would insure workmen being educated along definite lines, thereby meeting the demand for competent leaders and executives. They would offer to young men of limited means, who would otherwise be forced into the large and growing class of unskilled labor, the opportunity to learn a trade. They would increase the efficiency of a plant, an industry, a people."

"An apprenticeship should make the following provisions for the employee: A proper term of service to insure ample time for instruction; sufficient remuneration to support the apprentice during his term of service; instruction in the technique of the trade and allied studies; instruction in the manipulation and care of the appliances of the trade; the fostering of a spirit of ambition and a desire for increased knowledge; and full recognition, upon the completion of the course, of what has been accomplisehed, by a diploma such as has been adopted by the National Machine Tool Builders' Association."

MANUFACTURERS SHOULD HAVE SCHOOLROOMS IN THEIR FACTORIES.

Magnus M. Alexander, of the General Electric Works at West Lynn, Mass., spoke on "An Effective Apprenticeship Program." He offered suggestions drawn from the big apprenticeship school established by the General Electric Works, saying in part:

"A rational apprentice system in its final anlysis is, after all, a trade school conducted in a factory. This at once implies that provision should be made whereby the apprentices are taught skill and at the same time receive a training of the mind. Any effective system of industrial education, whether promoted through an apprenticeship in the factory, private trade schools, or the public school system, must be based on the broad principle of correlated instruction in the trade itself and the related sciences, and an adequate amount of general culture.

"Large manufacturers can take care of both sides of the apprenticeship question

by initiating the boys into the trade and also giving them such class-room instruction as will enable them to carry out their work intelligently. Smaller employers can achieve the same general result by calling upon the public schools or existing private educational agencies, for the educational development of the boys, while they themselves teach the trade in their shops where, after all, the trade can best be taught. Manufacturers of a community may also combine by establishing joint school-rooms for their apprentices. In any case, there should be close relation between theory and practice; the theory should be taught in as practical way as possible and the practical work developed along educational lines.

COMMERCIAL WORK ADVOCATED.

"Inasmuch as apprentices are trained for industrial life, they should, as far as possible, be trained in industrial life, or in other words, should work from the beginning under conditions that approximate those under which they will later on earn their living as industrial workers. Accordingly the apprentice should start on commercial work, for this shows him his position as an economic unit in the factory organization and thereby clinches his interest. He sees that the product of his work is to be a part of some useful machine rather than a plaything or an object of exhibition in some show-case and therefore learns to appreciate the value of time and money.

"For this commerical work, apprentices should of course be paid. While the amount of wages will depend to a large degree on local conditions and the prevailing compensation for labor, experience has shown that a liberal treatment of the apprentice wage question will prove beneficial in the long run; it will enable the employer to select a high grade of apprentices and will allow the boys coming from poor homes and distant places to take advantage of this opportunity of trade training. Class-room instruction should be carried on during the working period for one or two hours every day and apprentices should be paid the same wages as when working at the bench or machine. It is a mistake to expect boys to come to school in the evening physically buoyant and mentally alert after a long day's work; they are then not in condition to reap the greatest benefit from the instruction.

"Employers have so far refrained from taking boys under sixteen years of age, believing that they are neither physically nor mentally able to serve an apprenticeship at an earlier age. My experience has proved, however, that excellent material can be found among healthy boys from fourteen to fifteen years of age."

A public meeting was held at 2 p. m. to discuss how far industrial education could be promoted by trade schools. George N. Carman, of Lewis Institute, Chicago, and John M. Shrigley, of the Williamson (Pa.) Free School of Trades, spoke on boys' work, and Florence M. Marshall, Director of the Boston Trades School for Girls, on the training suitable for girls.

TECHNICAL EDUCATION IS NOT TRADE EDUCATION.

Mr. Carman distinguished sharply between technical training and trade training. He said:

"Much of the special or technical instruction that is needed to-day can be obtained after leaving school better than in school, if the school had furnished that broad and generous foundation which the education of after life cannot supply. Too much technical training cannot be given, but it can come too soon and at too great a cost if it crowds out other instruction which cannot be had except in school.

"We must distinguish between technical instruction and the trade school. Technical instruction may be given throughout the entire school period. There is a place for it in the education of the child in the elementary schools and of the youth and adult in the secondary school, the college and the university. Technical instruction may be preliminary to the actual work of a trade or upplementary to it. The trade school is a secondary school that fits its students for a trade just as other secondary schools may fit their students for colleges."

MAKE ELEMENTARY EDUCATION MORE INDUSTRIAL.

"Elementary education should be much more industrial than at present. Technical instruction has a place in the elementary school. It should be adapted to the needs of all children regardless of differences in sex, aims and future occupations. I agree with Professor Dewey that the child in the elementary school should be led to consider and to get some practical hold of the activities that center in the family—the house and its structure; clothing and its construction; food and its preparation; that the only adequate basis for that unity and correlation of studies that gives interest to the work of the elementary school and makes it effective, is the child's own activities of primary expression—his constructive powers."

Miss Florence M. Marshall, Director of the Boston Trade School for Girls, spoke on behalf of women in industry. "All history," said she, "proves that women have a right to industry. Moreover, many lines of industry are dependent on woman's skill, such as industries dealing with clothing and household products, and woman herself is dependent on the opportunity to participate in constructive industry in order to reach her highest development. The fact that a number of industries are able to use women's labor in the unskilled processes, and that the present organization of industry prevents them from becoming skilled workers without training, necessitates provision for trade education.

"Assuming that a study of the locality has revealed that three-fourths of the girls enter industries with a grammar school training or less; that there is no opportunity for them to enter skilled industries because of lack of training, even though the industries are in need of skilled workers; and the kind of work girls are doing is detrimental physically and morally, is lowering to their standard of living and hence having a bad effect on our future homes, the following scheme for a school is mapped out:

"The requirements for admission should be at the limit of the compulsory school age. The course of study should combine a school and workshop, the type of workshop to be determined by the skilled industry of the locality. The academic work should be definitely applied to the trades being taught. The technical work should be organized so that each year should fit for some definite step

in the trade, so that the girl who could spend but one year could at least gain entrance to a skilled industry, even though her work be of the simplest character. The academic teacher should have the power to adapt the work to the demands of the trades, giving practical problems aimed at practical results. The managers of the workshops should be trade workers with teaching power, but the shops should be conducted according to the principles of the trade."

ROUND TABLES PROVOKE DEBATE.

Three round tables for open discussion were held at 4 p. m. in the committee rooms of the Capitol. These seemed to provoke very active debate. The subject offered at the first was "Industrial Training in the Public Schools." County Superintendent, M. L. Duggan of Sparta, Ga., acted as leader, and William C. Hammel of Greensboro, N. C., and Albert A. Snowden of Newark, N. J., contrasted the views of North and South. Mr. Snowden represented the recently appointed State Industrial Commission of New Jersey which is now pushing the industrial school question.

Arthur D. Dean, Chief of the Division of Trades Schools of the New York State Education Department, acted as leader for the round table devoted to "Trade School Organization," and Arthur L. Williston, Director of the Department of Science and Technology, Pratt Institute, Brooklyn, was leader in the discussion on the "Advantages of Evening Schools."

In the debate on the round table on evening school work, Louis Rouillion, Director of the educational work of the Mechanics' Institute of New York, stated that training at night schools was the most practical form of trade teaching. He said in part:

"In Great Britain the evening vocational schools are wielding so large an influence that all attempts at day training are almost eclipsed. In this country by far the larger amount of real vocational training that is definite and effective, is being done in the evening schools. The reason is not far to seek.
The evening school does not interfere with the pupil's present earning capacity, nor with his hours of labor. It only asks for some of the time that would otherwise be lost in idleness or in pursuit of amusement. In vocational training the evening school has a decided advantage in that it does not have to force or urge a boy to select this or that trade, but finds him already employed as a plumber, a mason, or a carpenter, with his ambition aroused to excel in his trade. The mere fact that a lad elects to attend an evening school puts him in the select class of the actively ambitions. This is one reason why the tone of the evening trade schools and mechanics' institutes is pitched to a higher and truer key than obtains in similar day school work. The earnestness and intensity of purpose of these students is a well attested fact.

"There is heard much talk about the self-sacrifice and hardships in a boy attending evening school after eight hours labor at his trade. Any one who has had to do with evening school work knows how misplaced is such sympathy. The school work is seldom a burden to the student, in most cases it is a real pleasure, as attest the faces of these students at their school work. This actual joy in their work is frequently reflected in the attitude and feelings of the teacher.

The reaction upon him is not one of exhausting his nervous vitality, but quite the contrary."

Leon C. Sutton, Editor of the "Labor World" of New York and New Jersey, spoke on "The Wage Earners' Benefit from an Effective System of Industrial Education." He urged the point of view of the wage earner, saying: "To some few manufacturers in the United States who want to have educated, at public expense, young men and young women, who, upon graduation from an Industrial School, can be used as a club to lessen the rate of wages or can be used as strike breakers, an effective system of industrial education means one thing. To the wage earner, on the other hand, who wants to have his children taught better than he was taught, it means something far different. He has a different standard. He wants the children taught not merely dexterity of hand but he wants them taught in addition to the theory of mechanics, the reading of blue prints and the use of tools, also the history of commerce, the ancient guilds, the origin and growth of Trades-Unionism, the story of the struggles through which it has gone, something of what real true unionism means in the betterment of the men and women of our country today, so that after their years of study in the industrial school they do not come forth with their diploma to eat up their fellow human beings by inferior work at lesser wage during longer hours and thus be an aid in undoing just what Trades Unionism has struggled so long and earnestly to win. They must start on their career at the foot of the ladder, well drilled of course, with a loyalty to their trade and a pride in their craftsmanship and yet a feeling that they have much to learn by practical experience.

ORGANIZED LABOR MUST AID.

"We believe that in any effective system of industrial education from which the wage earner is to derive a benefit, organized labor must have a part. The young men and the young women educated in the various handicrafts which they have chosen in the trade schools, will be either the friends oi the enemies of organized labor.

"It is not necessary that pupils should be taught to be rabid unionists or to be strike breakers but they should have their consciences awakened and they should learn what Trades Unionism means, what it has accomplished and what it hopes to attain. When once they have been taught to think we will risk the rest and an effective system of industrial education can confer no greater benefit upon the future workingmen and workingwomen than to teach them to think, in addition to using their hands.

"We have said that an effective system of industrial education must include the co-operation of the Trade Unionist. The pedagogue sees in theory the value of such a training, the manufacturer sees the value of its productiveness, the Trades Unionist see its human side and these young men and women are to be his successors. He remembers his trials and sacrifices and he goes with natural caution, but admit him to his proper place among the boards of control and among the practical instructors, give due weight to his advice and then his attitude of suspicion will be turned to one of cordial co-operation."

L. D. Harvey, Superintendent of Schools, of Menomonie, Wis., and President of the National Education Association, spoke on "Industrial Education in the Pub-

lic Schools," and was followed by Dr. Thomas M. Balliet, Dean of the School of Pedagogy of New York University. Dr. Balliet made plain the distinction between manual training and industrial training and urged that special vocational schools be provided to take the pupils at the age of twelve.

MAKE MANUAL TRAINING PRACTICAL.

Dr. Balliet said in part:

"So far as the elementary schools (apart from special vocational schools) are concerned, the following forms of vocational and industrial training are possible: cooking and sewing; manual training for all through the entire course; drawing, color work, design and the elements of industrial art for all. The closest possible co-ordination between the drawing and manual training hould be made.

"In manual training mere exercises should be eliminated and 'projects', which appeal to the interest of children, made. The teacher may be interested in the exercises involved in the 'projects,' the pupil is interested solely in the thing made. When children make things which they are not even willing to sell, then manual training for them is industrial education. The product has high value for them, although it may have no market value.

"Manual training of this kind appeals most strongly to children's interest, forms a natural transition to strictly vocational industrial training, and forms the broader training on which specialization in vocational training should be based. It bears the same relation to the latter as a liberal education does to professional training in the higher institutions of learning.

"Special vocational schools should also be provided which would take the pupils at the age of twelve, regardless of the grade to which they belong in school, and give them a four years course fitting them for some trade or vocation. Most communities will not be ready for several years or more to undertake the establishment of this type of schools although several cities have already done so.

"In this type of trade school it will be difficult to hold boys until they complete the course. There is therefore danger of 'flooding' the market with half-trained boys to which just objections can be made by labor unions. Labor unions themselves can do much to prevent this by refusing to admit to membership boys who have not completed their course in school or as apprentices. Labor unions must ultimately have a voice in the management of trade schools as they now have in Germany.

"We must establish evening trade schools in the shops of manual training high schools. This has been done in a certain number of cities where there is such a day high school, and as this is the easiest sort of trade school—and the least expensive—to establish, it should be, under such circumstances, the first one to be undertaken.

THE ANNUAL MEETING.

The afternoon session was devoted to the Annual Meeting of the Society. Reports were read by the officers and the Secretary gave a review of the year's work. The society now has a thousand active members scattered throughout the United States. State Branches have been organized in Alabama, Georgia, Massachusetts, Montana, New York, Ohio, Pensylvania, Rhode Island and Virginia.

These Branch Societies have their own constitutions and officers and carry on independent work, but the members also have the privileges of membership in the National Society and receive its publications. State Committees have been organized in twenty-eight States, and, as they increase in size, will become Branch Societies.

The Society has published and distributed to its members and others, seven bulletins, as follows:

No. 1—Proceedings of the Organization Meetings.
No. 2.—A Selected Bibliography on Industrial Education.
No. 3—A Symposium of Industrial Education.
No. 4—Industrial Education for Women.
Nos. 5 and 6—Proceedings of the First Annual Meeting, Chicago.
No. 7—Circular of Information.

Much other matter on Industrial Education has been distributed.

The Society at a recent meeting voted to include in it objects "the promotion of education in mechanic arts in their relation to agriculture and mining."

As a result of the efforts of the New Jersey State Committee, the Senate and General Assembly of that State appointed a Commission on Industrial Education to "inquire into and report to the next Legislature upon the subject of promoting industrial and technical education."

The following officers were elected for 1909-10: President, Alexander Humphries, Stevens Institute, Hoboken, N. J.; Vice-President, Walter C. Kerr, New York. Frederick G. Pratt, New York, was re-elected Treasurer. The secretaryship is to be filled at the next meeting of the Board of Managers, at which time expires the term of office of the present secretary, Dr. James P. Haney, New York.

OHIO ART AND MANUAL TRAINING TEACHERS' ASSOCIATION.

The attendance at the 1908 meeting at Detroit, November 13th, was the largest this Association ever had. The membership was almost double and all sections of the State were represented. It is hoped, however, that all the teachers of manual training, domestic science, domestic art and drawing in the State will soon ally themselves with their State association. This may be done by the payment of the annual fee of fifty cents.

All the sessions of the Association were held in the beautiful Central High School building. The Friday morning session was called to order by the president, F. C. Whitcomb, Professor of Manual Training, Miami University, Oxford, at 9 o'clock. The subject of the president's annual address was "One of Our Problems." He said:

"My purpose in presenting this paper to the Ohio Manual Arts Teachers is to urge them to make a study, as a body, through a good strong committee, of some one of the as-yet-unsolved problems in our field of labor. It seems that the time has come for the leaders in the manual arts to come to a closer agreement on a more definite basis for their work.

"All of us are agreed that no rigid course of study in any manual arts line, permitting of no adaptation to local school and community conditions, is desir-

able. But a basic or underlying principle, broad in its scope and adaptable to local conditions, would place the arts on a firmer foundation, give them a higher standing among school subjects and have a tendency to keep teachers within fairly definite bounds. So much of this work appears to be mere busy-work, seat-work or what-not, having little purpose in the curriculum and of less educational value."

He suggested three methods of development for the course of study: First, the making of the manual arts the basis for all of the work of the school; second, study of the primitive and modern industries; and third, the immediate needs and interests of the home and school.

"A course following the third method of development seems to be the most practicable one for the average school. This method of development starts with matters of immediate interest and concern to the pupil in his home and school life, and leads, in a constantly enlarging circle, to something of a general knowledge of the outside world."

He emphasized the importance of having a main center for each grade or grades; home was suggested for grades one and two; school for grades three and four; school with some attention to the community interests as a center for grades five and six; the world beyond the school as a center for the boys and home the center for the girls in the seventh and eighth grades. The centers for the work of the high school are to be home for the girls and interests of the outside world for the boys.

Miss Jennie L. Thomas, Director of the Thomas Normal Training School, Detroit, Michigan, gave an excellent address on the "Training of Teachers." She said in part:

"The training of teachers embraces a personal side, involving manner and method, and a technical side involving the actual knowledge of material taught. One of the most difficult problems which confronts teachers of normal students and one which is of most vital importance is the development of the personal qualifications of each student. In fact it is often said that personality must be born and cannot be taught or developed. Nothing was ever farther from the truth. The natural qualifications of the student are, of course, a great help in fitting him or her for life work. But if these qualifications are lacking they can and must be developed. This part of the training of teachers is too often relegated to the background and in many cases is entirely lost sight of in the eager striving for perfection on the professional side. The ideal teacher of the child is one who, in every way, is a model for the children to pattern after. She is cheerful, patient, tactful, kindly and of a broad sympathy that will appreciate every child's surroundings and obstacles. The teaching of drawing or music or any other subject to a child is but half of the teacher's duties. While instilling into the mind of the child any one of these subjects she must at the same time be preparing him in every way, as well as in her power, to be a great and good man, to grow into the proper habits of thought and reasoning, to grow in heart as well as in mind, to the end that he may become fitted to get the best there is out of life wherever or however he may be situated.

"Of all the personal qualifications that go toward the making of a successful teacher, I should place first TACT, or the instant appreciation of what is

fitting under any set of circumstances. The dictionary defines tact as 'the quick or intuitive appreciation of what is fit, proper or right.' Sometime ago there appeared in one of the school journals the following definition of that word: 'Tact is the intuitive knowledge of what not to do.'

"Most of what I have said may be imparted in the class or study room. At the same time, the personality of students may often be more strongly and effectively influenced by a teacher in that closer intimacy which comes only with acquaintance outside of the class."

Professor Thomas K. Lewis, Assistant Professor of Engineering Drawing, Ohio State University, gave an address entitled, "Manual Training and Drawing for College Entrance Credits."

"University and high school professors must discuss the problems involved in the proposition to place manual training and freehand drawing in the list of entrance credits.

"To be acceptable to College Entrance Boards the content of these courses should be such that the high school students are well prepared to enter classes in the universities and colleges. The college professor is anxious to have training offered in the high school, which will prepare the students for doing laboratory work, he wants them to be self reliant and resourceful, and to be able to accept personal responsibility.

"On the other hand, the high school professor knows the value of correlation with other subjects. He is also limited in the amount of time which he can use for these subjects. He must consider how long the pupils are likely to attend high school, whether for one, two, three or four years, whether they are going to college or to a trade school. He studies the mental capacity of each pupil to determine which work would be most profitable for the student's individual case.

"Many university professors, especially those who are teaching in engineering and technical courses, recognize that the students who are now entering the universities and colleges have not had the valuable training which was afforded formerly by the study of mental and advanced arithmetic. They want to know if these courses have been driven from the public school curriculum, and, if so, they demand a return of them, or the introduction of such work as shall furnish the same valuable training. These men would be in favor of manual training and freehand drawing if they knew the content of these subjects. By adding them to our list of subjects to be chosen at large, we not only allow the high school boy a more liberal allowance for college entrance, but we are offering the real mental drill which is highly desirable, and we cause a demand for these subjects in the high school. A boy will be doubly interested in taking manual training and freehand drawing, if he knows he will receive entrance credit, and at the same time be better prepared to pursue his chosen work in the university.

"Trade schools have in many cases failed because: First, they did not require enough fundamental training before offering the special subjects; second, they began too early in the life of the high school pupil, when he was not sufficiently mature to appreciate the valuable training he might receive. To be successful the special work of the trade school should follow two years of manual training in the high school and continue for four years. The trade school is a

technical school on a small scale and should be governed as such, and fundamental subjects should form its working capital just the same as in large national institutions."

"In defining a unit in manual training and freehand drawing, the amount of time allotted and the content of the subject should be carefully specified. It it not enough to state that a certain number of hours should be devoted to wood working, forge work or pencil drawing, and suggest a few projects for illustration. If we are going to give these subjects their higher value, and elevate them to their true level among other subjects of the curriculum, we must come to a better understanding, and plan our courses with each other, and at the same time give some consideration to the opinions of the members of the university faculties."

He suggested the following course in freehand drawing:

"The minimum time given for one unit in freehand drawing should not be less than the equivalent of 240 hours of 60 minutes each.

Pencil or Charcoal. One half or one unit. A thorough knowledge of how to draw lines in the various foreshortened positions, with methods of proving the accuracy with which they are drawn. Careful drawing of circles in foreshortened positions. Testing same. Drawing of combinations of various geometrical solids, *e. g.,* the pear (sphere and cone), crank arm (cylinders and elliptical prism.)

An accurate knowledge of values, including values which are identical in different parts of the same or different models. The meaning of uniform and blended values.

The practice of attempting to copy values from the model is most heartily condemned. Such work is worse than worthless. Students should be taught to model forms."

The course suggested by Professor Lewis in manual training is very similar to the one suggested in the report of the Committee of the Western Drawing and Manual Training Association. (This report may be secured from the Chairman of the Editorial Board, William T. Bawden, Normal, Illinois.)

At the business meeting which followed these addresses, the following officers were elected for the coming year: President, H. W. Lowell, Director of Manual Training, Columbus, O., Vice-President, Miss Emma McKinley, Supervisor of Domestic Science, Dayton, O., Secretary-Treasurer, Miss Anna Bier, Supervisor of Drawing, Greenville, Ohio; Executive Committee, C. E. Collins, East High School, Toledo, Chairman; J. J. Rogers, Shaw High School, Cleveland, and the officers of the Association ex-officio.

The following Standing Committee on College Entrance Credits was appointed: Professor T. K. Lewis, Chairman; Edwin Johnson, Instructor in Manual Training in Woodward Colony High School, Cincinnati; Miss Emma McKinley, Dayton, Ohio.

The Association voted to meet with the Central Teachers' Association in 1909; this meeting will probably be at Dayton next November.

The afternoon was devoted to three sectional meetings. H. W. Lowell was the leader of the manual training section. At this section A. C. Armstrong, Director of Drawing and Manual Training at the Thomas Normal Training

School, presented an address entitled "Education of Manual Training Teachers along Art Lines." He said in part:

"The change in method of teaching manual training from the old *blue print* method to the present one of considering the individual in the planning of a course of work has brought into the problem the question of the design of the piece. It is evident that if all pupils are not doing the same model, that the instructor must know a great deal about art in order to pass judgment upon the sketches made by them.

Proportion must be carefully considered and the presence or absence of decoration upon the piece decided upon, that the result as a whole shall be agreeable to the eye and wholly satisfactory. In order to have good judgment about such matters the teacher of manual training *must* know the principles involved in the construction of a piece of good design. In other words he must be a designer as well as an artisan. The work cannot be intrusted to the drawing teacher because of the lack of knowledge on the part of such teacher of the structural elements involved. It is the business of the manual training teacher to know the first steps involved in the making of a piece of work and the first and most important step is the drawing. When the manual training teachers have been trained in art they are capable of executing the entire problem in such a way that the results shall be worth the expenditure of time and material. Then and then only have the possibilities of the problem been exhausted."

J. C. Trybom, Director of Manual Training in the Public Schools of Detroit, followed with an address on "Manual Training for the Boys in the Fourth, Fifth and Sixth Grades." He said in part:

"We begin cardboard construction in these grades by acquainting the pupil with the qualities of geometrical figures and the manner of constructing them."

"The knowledge of their construction may be looked upon as the tools with which later problems will be solved, *i. e.,* a tool in the same sense as the multiplication table is a tool in the solving of problems in arithmetic. Time is wasted in this line of work, it seems to me, when the fundamental habits of a slow and careful procedure in the use of the tools and instruments have not been formed during the earlier stages of the work, when the pupil has not learned the lesson that it takes time to do a thing well, or when the simple elements of mechanical construction are only picked up incidentally, if not accidentally, in passing from one model to another. When a second term class in cardboard construction, for instance, has not mastered the use of the triangle or the steps in constructing a square or the method of cutting on a straight and a curved line, but have to refer to their teachers constantly for information on these points or fail, then their time and the teacher's time is wasted because it could be more profitably employed. Even the more progressive grade teacher will admit that extensive repetition and even drill are necessary in teaching the multiplication table. Even in this subject it seems to me that we should review and review and review these elementary processes, as they are the only means by which our problems can be solved and independent work done. We emphasize in these days, and rightly, too, independent work and personal initiative on the part of our pupils, because it is by this line of work that the mind is trained in its most important functions, reasoning and invention. Model making, pure and simple, does not develop these powers, however attractive the material.

"Our multiplication tables in cardboard construction are: First, a certain knowledge of the use of instruments; second, familiarity with the qualities of the geometrical figures; third, knowledge of their construction; fourth, the habit of slow and careful procedure in using the instruments. These elements, tools, processes, we proceed to teach our boys in the B-4th class."

Mr. Trybom illustrated his talk with a number of pieces of cardboard construction, showing the excellent work the pupils under his direction are doing along this line in the Detroit schools.

Miss Faith R. Lanman, Director of Domestic Science in the schools of Columbus, was the leader of the Domestic Science section. Miss Grace P. McAdam, Director of Domestic Science in the Detroit schools, presented an address entitled "The Teaching of Domestic Science in its Relation to the Home." She said in part:

"Every child must learn not only the ordinary subjects taught at school, but also the practical duties of life—boys, a trade; girls, house work. This was the teaching of Martin Luther, the founder of the German common school system, and the greatest educator of his time, who also believed that parents are responsible for the education of their children.

"As the child is the product of the home, and is being trained for the home, so the home must unite with the school in this training. Especially is this true in relation to domestic science; the teacher must have the intelligent and helpful interest of the mother, for the best results.

"It is comparatively easy to have the sympathetic interest of the mother, through the interest of the child. So long as the child is happy and enthusiastic in the work, the mother will endorse it, but if for any reason, the child's interest lags, the mother may decide that it is just as well to drop the work, whereas if the mother's interest were co-operative, the combined efforts of the mother and teacher might again establish renewed interest. To arouse this kind of interest in the study of domestic science as an educational factor, the mother must first believe in the importance of the study; second, see its practical application.

"To believe in anything one must first become acquainted with it, consequently must come in touch with it. Invite the mother into the kitchen, so she may see conditions and talk the subject over with the teacher. One mother visited the kitchen to investigate the temperature, because her little girl, an only child, was very susceptible to colds. The conditions were favorable, and she expressed the hope that the child would not miss many lessons. In this way, many little things not made clear to the mother by the child, are satisfactorily adjusted."

"It has been said that 'whatever you do for the country must be done for the people, and that whatever you do for the people must be done for and through its children; then all right knowledge of right living that can ever be collected, under the name of home or social economics, all the wisdom of our wisest educators, will be needed before we can put into the hand of the little child the tools that are to help him to this broader citizenship, this fuller life.' "

The next paper on "The Ways of Teaching Domestic Science and Domestic Art Without an Equipment," was presented by Miss Harriette I. Robson,

Director of Domestic Science and Domestic Art at Thomas Normal Training School. The following is a brief outline of her address:

"1. The place and importance of the regulation equipment in the teaching of domestic economy is very full of sigificance. If you are to consider this subject a branch of applied science the work is deserving of every possible aid that a well appointed laboratory can give. The ethical value of such a school kitchen upon the student is also very great. The work of the teacher is also greatly facilitated.

"2. But the supreme factor in the teaching of domestic economy is the *personality of the teacher* and her ability to arouse and satisfy in her pupils an enthusiasm and vital interest in household activities which will have a direct and immediate influence upon their present daily lives.

"3. Our problem is that of the smaller towns and even rural communities where the expense of the regulation equipment and a special teacher makes the work impracticable. The need of the socializing influences of domestic economy in these communities is usually very urgent.

"4. Evidences of a desire and willingness on the part of the regular teachers in these places to undertake the work of instruction and to act as leaders in this all-important campaign of 'right living.'

"5. Ways in which the trained and regularly-qualified teachers of domestic economy may lend a hand in helping these teachers to work out their local problems.

"6. This idea is not a new one. What has already been done in various places. Some typical examples and general plan of the work as carried on in some actual communities. Results. The financial problem.

"7. Some practical suggestions as to the course of study, methods, teachers' aids, and turning an ordinary class room into a temporary kitchen or sewing room."

Mr. Frank E. Matthewson, Assistant Principal of the Technical High School of Cleveland, was chairman of the Drawing Section.

Mr. W. D. Campbell, Supervisor of Drawing, Columbus, gave an address on the subject "Should Drawing in the Public Schools be Based on Art Principles or Should the Educational Side be Emphasized Most?" He said in part:

"Too often we find too much of the Supervisor manifested in the work of the pupils. The educational side of art should be emphasized more than it usually is. The supervisor and the grade teachers should work in harmony, the supervisor helping on the art side and the teacher on the side of the general curriculum.

Mr. Campbell emphasized the work in landscape: First, do practical work, giving free expression to the individual; second, use large pieces of paper for drawing work; third, strive for bigness and broadness; fourth, teach handling of materials; fifth, work from observation, memory and illustrations.

Mr. Campbell illustrated his address by a large number of excellent drawings which had been made by the Columbus pupils.

The address by Mr. J. J. Rogers was on "The Teacher's Attitude to the Backward Pupil." He said: "We should study the reason for the backwardness of the pupil. Often it is caused by defective eye-sight or hearing. Prob-

ably he is not interested in his work. Boys full of mischief should be carefully dealt with. Often domestic conditions have much effect on the work of the pupil in the school. If the pupils are backward do not discourage them but use every endeavor to get them interested in their work." He mentioned several cases of boys who had been very backward in their school work but who later in life had developed into very brilliant men making their mark in the world.

F. C. WHITCOMB,
Miami University, Oxford, Ohio.

HIGH SCHOOL CONFERENCE.

The annual High School Conference of the University of Illinois was held at the University, November 19-20-21, The meetings were attended by about 400 teachers, representing 175 different schools.

The first session was a round table discussion Thursday evening in the chapel, presided over by Prof. Hollister, High School visitor of the University. During the discussion on manual training entrance credits, a plea was made for more than one entrance credit for four years' work. The chairman was asked about the report of the manual training committee of the North Central Association of Colleges and Secondary Schools, which made a credit allowance of six units for high school work in the mechanic arts. Prof. Hollister stated that the report of the committee mentioned merely defined the units of credit but did not recommend the allowance of them by the Universities; that the University of Illinois was now giving more entrance credit for manual training than other universities and that it would remain conservative in regard to giving entrance credit to the extent of more than one unit.

The Manual Arts section was in session Friday morning and afternoon, presided over by E. V. Lawrence of the University of Illinois. W. H. Varnum of the James Millikin University, gave a talk on the "Necessary Elements in a Public School Course in Drawing," illustrating his talk with mounted samples of work. He advocated a four years' course in the high school, one half of the time being devoted to composition, the other half to applied art. The work in representation should be (1) perspective, (2) applied arts, (3) from imagination. The applied art should begin in clay, and proceed to leather, then copper and brass, and silver. Nothing should be wasted.

Miss Clarissa Ela of the Illinois Normal University presented an "Outline of a Course in Freehand Drawing for Grades 1-12." She then gave a discussion of the work in the graded schools. The objective point of teaching should be the appreciation of the beautiful. The important thing is the individual. Pupils should be as free to draw as to write. The past serves as an inspiration. The course should begin and end with color.

In the afternoon session Miss Ida Tindall of Pontiac outlined a course in design for grades one to twelve. Her outline requires the pupil's best efforts always and every design to be applied. It demands that every article made shall be well made and ornament to be structural, not constructed. Its purpose is the education of appreciation and the power of right choosing.

F. D. Crawshaw, Assistant Dean of the College of Engineering, then gave an outline of a course in mechanical drawing for graded and high schools which

was developed by several years of experimental work in the Peoria Public schools and given in book form in "Problems in Mechanical Drawing," by Chas. A. Bennett.

A committee consisting of W. H. Varnum, James Millikin University, Decatur; Miss Ida M. Tindall, Pontiac; F. D. Thomson, Galesburg; F. D. Crawshaw and E. V. Lawrence of University of Illinois was appointed to formulate courses of study in mechanical drawing, and freehand drawing and design, for the State, for which the University will be asked to give credit.

The Domestic Science section held one meeting Friday morning. The committee appointed last year to prepare a course of study, made its report. (A printed syllabus of this report may be obtained by addressing the Domestic Science Department, University of Illinois.) Permanent organization of this section was provided for by the appointment of the following executive committee: Miss Helena M. Pincomb, University of Illinois; Miss Jenny H. Snow, Chicago; Miss Carrie Galt, Springfield.

By far the best part of the conference was the address by Dean Eugene Davenport, on "Industrial Education." To repeat the good things in it would require a verbatim report. The address has been printed and may be obtained by writing to Dean Davenport, College of Agriculture, University of Illinois.

WILSON H. HENDERSON,
Springfield, Illinois.

IOWA MANUAL TRAINING ASSOCIATION.

Iowa manual training teachers have for some time realized the necessity for organization. At the Southeastern Iowa Teachers' Association such an organization was discussed and a committee was appointed to correspond with the other manual training teachers concerning the matter. The idea met with approval and on November 20-21 the organization meeting was held at Cedar Falls in the new Science building of the Iowa State Normal School.

Charles H. Bailey, director of manual training, Iowa State Normal School, who was instrumental in bringing about this meeting, had made arrangements for two sessions. At the first session, Friday evening, President Seerley gave an address of welcome, William T. Bawden of the Illinois State Normal University gave an address on "The Function of the Hand in the Expression of Thought," and Forest C. Ensign, of the Iowa State University and inspector of schools, delivered an address on the subject, "The Status of Manual Training in Iowa." After this program there was a short business meeting at which Mr. Bailey was chosen chairman.

At the second session, Saturday morning, there was a lecture by A. C. Newell of Des Moines on the subject "The Value of Forestry in Manual Training." Miss Ellen J. Wing of Tipton, Iowa, read a paper on "Handwork for Seventh and Eighth Grade Girls." W. H. Blakely of Fort Dodge, Iowa, read a paper on "Iowa's Manual Training Problem from the Standpoint of the Industries." At the business meeting an Association was organized and officers elected. The officers for the ensuing year are: President, Charles H. Bailey of Cedar Falls; Vice-President, W. H. Blakely, of Fort Dodge; and Secretary-Treasurer, A. C. Newell of Des Moines.

The following notes will give some idea of the character of the addresses and lectures:

Mr. Seerley's address was one of welcome to the Iowa Manual Training teachers. A few extracts:

"The idea that education constitutes a certain knowledge of books is a mistake. . . . Education needs to be helpful to the life of the individual. . . . The old curriculum has long since failed to do what its aim is. . . The teacher problem is the greatest problem before us. We need good competent teachers to teach these things."

The following is a summary of Mr. Bawden's address:

"Modern civilization has been marked by an amazing development of methods of applying force, energy. All of these achievements are directly dependent upon the skilled hand as well as the intelligent mind.

"What is material and substantial in this civilization constitutes the expression in concrete form of those innumerable thoughts and impulses, plans and purposes, that have originated in man's mind. In this expression the hand has had an absolutely essential part.

"Manual skill alone is not enough. The trained hand should be supplemented by the trained mind and the two trained to work together.

Training the individual to use his hands makes him more serviceable to society. If any undertaking is planned by a given group it can go no further than the plans until some one is found who can execute it.

"To train an individual in the use of his hands is to develop in him one of the sources of true contentment and happiness."

In discussing "The Status of Manual Training in Iowa," Mr. Ensign said in part:

"If there ever was a time when we were static in our schools it is now. . . . We are in a state of unrest. This is shown in our lust for a change or revision of school laws, by the discontentment through and through all society and among the leaders of society, and by the demand for a new set of secondary schools—the Agricultural High Schools.

"Manual training is to meet this feeling of unrest. . . The combining of the technical with the scholastic is a success.

"It is necessary that the high school and the college serve their one purpose rather than that of the University."

Mr. Ensign then from statistics showed to what extent manual training is carried on in the State. He also told of the credit given for manual training in our own university and in those of the north central states.

To those not familiar with forestry and lumbering, Mr. Newell's lecture on the "Value of Forestry in Manual Training" was of great interest and value. He showed by means of the stereopticon what would cost considerable time and money if study and travel alone were resorted to. Some of the things of which he spoke are: the effect of lumbering on streams, growth of trees, shrinkage, and how to explain the same, piling for seasoning, seasoning, lumbering, felling, logging, floating, sawing.

Miss Wing, in her address on "Handwork for Girls in the Seventh and Eighth Grades," showed what she has done at Tipton and what competent and

enthusiastic teachers may do in even small towns. She brought with her a great number of articles which have been made in these grades under her supervision. In concluding her paper she said: "If I could give my girls just what they ought to have, and had the room, the time, the apparatus, and the properly trained teachers, they should have an hour per week of cooking, of sewing, and of bench work. They would go into the high school better students in every way than we are sending to-day without this work. Just as our pupils from the rural schools are among the strongest students we get because they have had much of this training of hand, heart, and head, so will the child who has had manual training through the grades outstrip the one who has lacked it. He is more fully developed mentally, morally and physically, more independent, better able to apply his knowledge, a better citizen, and a truer socialist, in the real meaning of that much abused term."

Mr. Blakely's paper on "Iowa's Manual Training Problem from the Standpoint of the Industries," was written after the heads of manufacturing establishments had been communicated with and the subject investigated.

Synopsis: "Iowa has been slow in introducing mauual training because household occupations have furnished an equivalent training. Skilled help is scarce in Iowa because boys through false notions have shunned the trades and have entered stores and professions. Instead of being content to stand first in the production of raw materials Iowa should seek to turn boys back to the farm and shop. This could be promoted by the establishment of agricultural high schools and later by trade schools.

"Manual training in the public schools promotes *industrial intelligence,* and should reflect the life of the community not alone in woodwork, but in textiles, pottery, printing, etc."

JACOB JOHNSON,
Denison, Iowa.

The Round Table of Supervisors of Drawing of Western Ohio held its annual meeting at the Phillips House, in Dayton, Friday, November 27th, the president, Miss Ella Bartholomew of Springfield, presiding. The attendance was good and the meeting took on its familiar informal character, which is probably the reason of its rather remarkable success.

Miss Bartholomew spoke of the death of Miss Mary Engle, of Middletown, Ohio, one of the most beloved and valuable members of the Round Table, and the Secretary was directed to send a letter of appreciation and sympathy to her friends in the name of the society.

The program was opened with an interesting report of the London Art Congress by Miss Woodmansee of Dayton. A paper was read on the Relation of Art and Manual Training, written by F. C. Whitcomb, of Miami University, Oxford.

Miss Petherew of Piqua presented a discussion of the work of the primary grades and Miss Kyle of Troy the work of the fifth and sixth grades.

Some very interesting examples of school work were examined and discussed.

The officers for the ensuing year are: Miss Mary Kyle, Troy, President, and Miss Clara Cosley of Marion, Secretary.

The Southern Minnesota Teachers' Association held its twenty-second meeting at the State Normal School, Mankato, November 5-7, 1908. In the Grammar School Section Miss Elsie Trimbey, Wells, read a paper on "Expression through the Hand." In the Primary section Miss Pearl Healey, St. James, read a paper on "Expression through Handicraft."

In the Manual Training and Domestic Economy Section the following program was presented: "Domestic Science in the High School," Miss May S. Ames, St. James; "Some Reasons for Teaching Sewing in the Public Schools," Miss Louise Clark, State Normal School, Mankato; "Proper Place of Domestic Science in the High School," Miss Myrtle D. Francis, Mankato; "Manual Training for Education, or as Part of a Trade School," J. F. Knowlton, Austin.

The first fall meeting of the Cleveland Manual Training Club was held Friday evening, October 30, 1908, in the Kennard House. After the dinner the topic "Aids to Manual Training Teachers; Publications and Illustrative Material," was discussed by C. A. Tuttle and Charles Marten. The annual election of officers resulted as follows: President, Wm. H. Lambirth, Central Manual Training School; secretary, Lytton S. Beman, North High School; treasurer, Lynn Beman, Sterling School.

At the regular monthly meeting of the New York Odontological Society held in March, 1908, Dr. W. H. Whitslar, of Cleveland read a paper on "Chirognomy in Dentistry," that may be of interest to teachers of handwork. It is published in "The Dental Cosmos," for November, 1908, p. 1261.

The Illinois Manual Arts Association holds its sixth annual meeting in Rockford the second week in February. Copies of the program may be obtained by addressing the secretary, Ira S. Griffith, 624 So. Grove Ave., Oak Park, Ill.

The Boston Manual Training Club enjoys the unique distinction of being the owner of a building of its own. This consists of a bungalow in the woods at Billerica, on the Concord River. It was built, saving the chimney, entirely by members of the Club, and is used for occasional meetings. There is open house for all members on holidays, and other times is rented to members and their relatives and intimate friends for a slight fee, which includes the use of coal, wood and oil. There is a large living room with open fireplace, a well equipped kitchen, and one chamber.

DEPARTMENT OF SUPERINTENDENCE.

The Department of Superintendence of the National Educational Association will hold its next annual meeting in Chicago, February 23-25, 1909. A bulletin

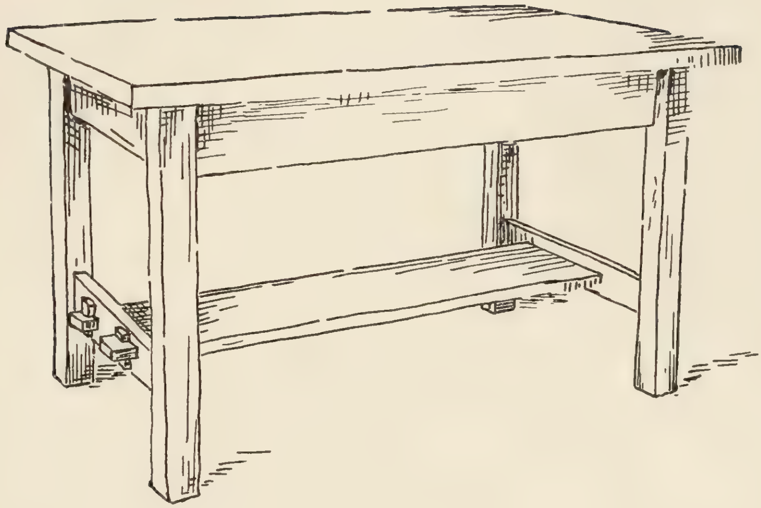
containing the final program and notice of railroad rates and hotel accommodations may be obtained from the Secretary, Irwin Shepard, Winona, Minn.

One general session is to be devoted to "Industrial Education," Wednesday afternoon, February 24th: "The Dignity of Vocation as a Fundamental Idea in Industrial Education;" "Shall Industrial Education be Treated as a Phase of General Education?"; "Industrial Education as a National Interest;" "Continuation Schools." The Round Table of Superintendents of Smaller Cities will discuss "What is Feasible in Industrial Education in Cities of 15,000 to 60,000 Population, and of What Kinds?"

Other general topics included in the program are: "Elimination of Waste in School Work;" "The Schools in Relation to Character Building;" "Problem of the Delinquent Pupil;" "Articulation of Higher Educational Institutions with Secondary Schools;" "Hygiene of the Public Playground;" "Fundamentals in the Elementary School Curriculum;" "Education with Reference to Sex."

A one-and-one-half-fare rate, on the "Certificate Plan," for territory east and south of Chicago has been granted on condition that 1,000 certificates be presented.

MADE BY MISS CORDELIA STANWOOD,
ELLSWORTH, MAINE.

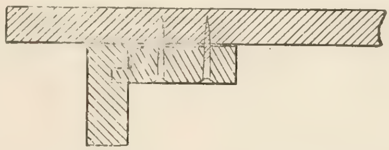


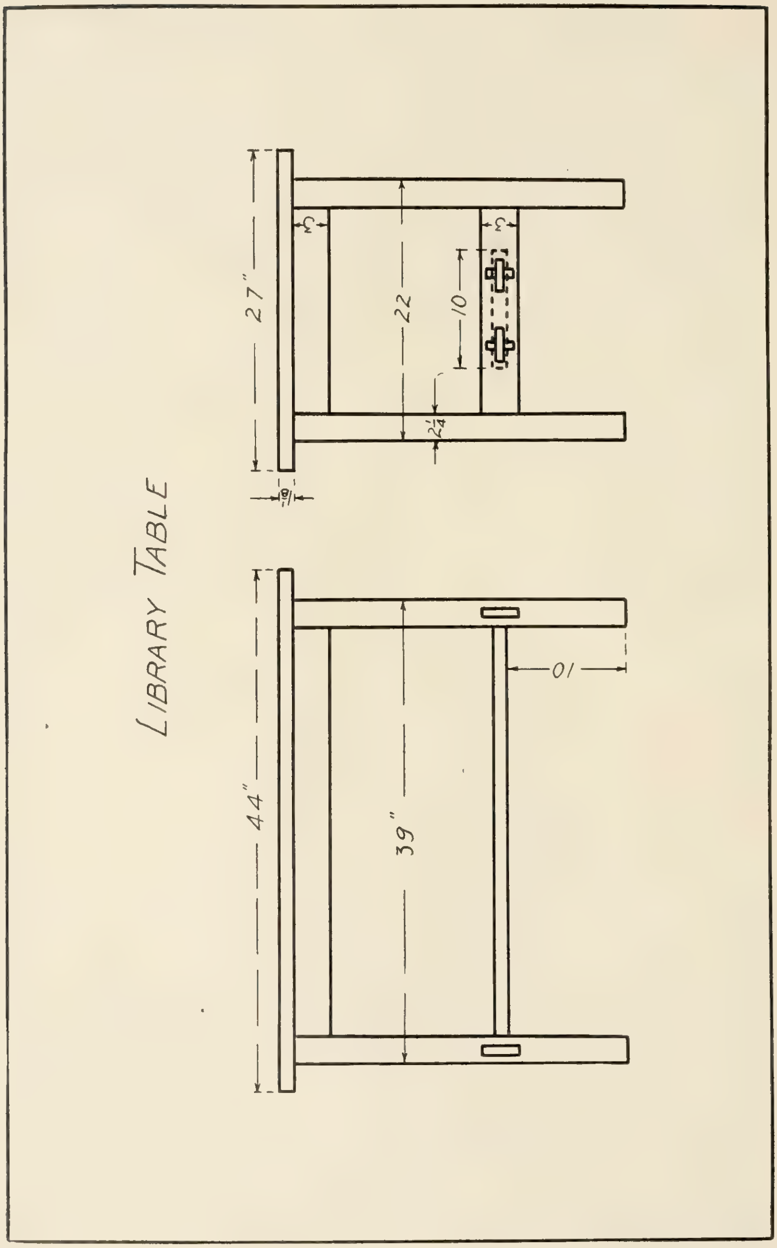
SHOP PROBLEMS

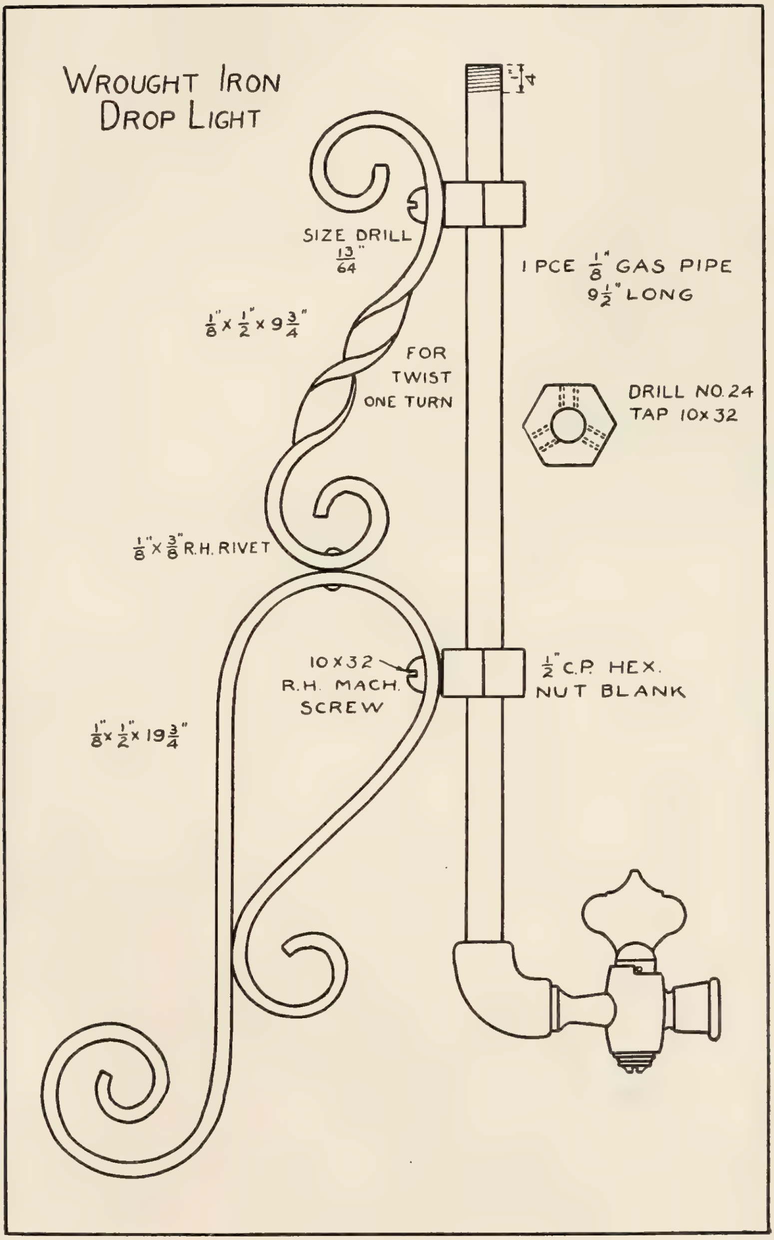
George A. Seaton, Editor.

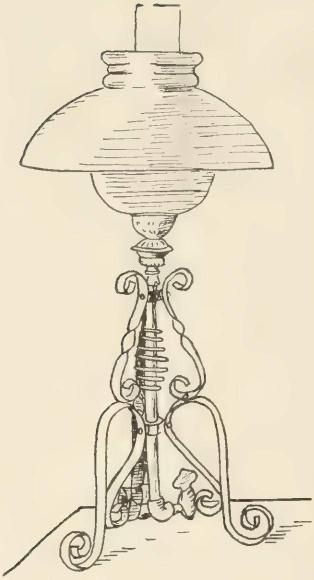
LIBRARY TABLE.

Among the larger pieces of furniture that can be undertaken by high school boys, there is nothing which is so elemental in its construction and yet so satisfactory when completed as the type of library table which is illustrated. As shown in the drawing there is no drawer but this might easily be added if thought desirable. No method of fastening the top in place is indicated and this in itself should form a problem that would set the boys investigating. On a table of this size possibly the best method would be the use of the regular angle irons which are sold for the purpose. If the materials already at hand are to be used small L-shaped pieces of wood can be made having one end of the L fitted into a small mortise in the side strips and the other end screwed to the under side of the top. In this way the tighter the screw is urged, the closer will be the fit between the top and side strips. The design is by W. E. Roberts of Cleveland.




LIBRARY TABLE
27"
22
10
3
3
44"
39"
10


WROUGHT IRON
DROP LIGHT
SIZE DRILL $\frac{13}{64}$"
$\frac{1}{8}$" x $\frac{1}{2}$" x $9\frac{3}{4}$"
FOR
TWIST
ONE TURN
1 PCE $\frac{1}{8}$" GAS PIPE
$9\frac{1}{2}$" LONG
DRILL NO. 24
TAP 10 x 32
$\frac{1}{8}$" x $\frac{3}{8}$" R.H. RIVET
10 x 32
R.H. MACH.
SCREW
$\frac{1}{2}$" C.P. HEX.
NUT BLANK
$\frac{1}{8}$" x $\frac{1}{2}$" x $19\frac{3}{4}$"

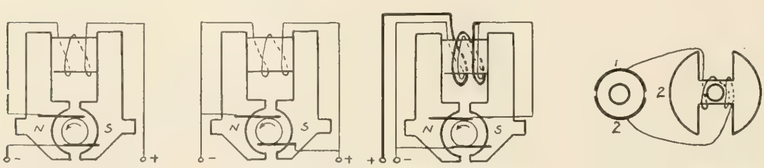


WROUGHT IRON DROP LIGHT.

The designs for problems in forging that have been submitted to the Shop Problems department have been so few that this line of work seems to have been neglected. Perhaps the publication of the drawings for the gas reading light will encourage others to send suggestions. The type of construction indicated may form the basis of any number of varying designs and E. H. Masters, of South High School, Cleveland, who sent the illustrations, has included a sheet giving suggestions.

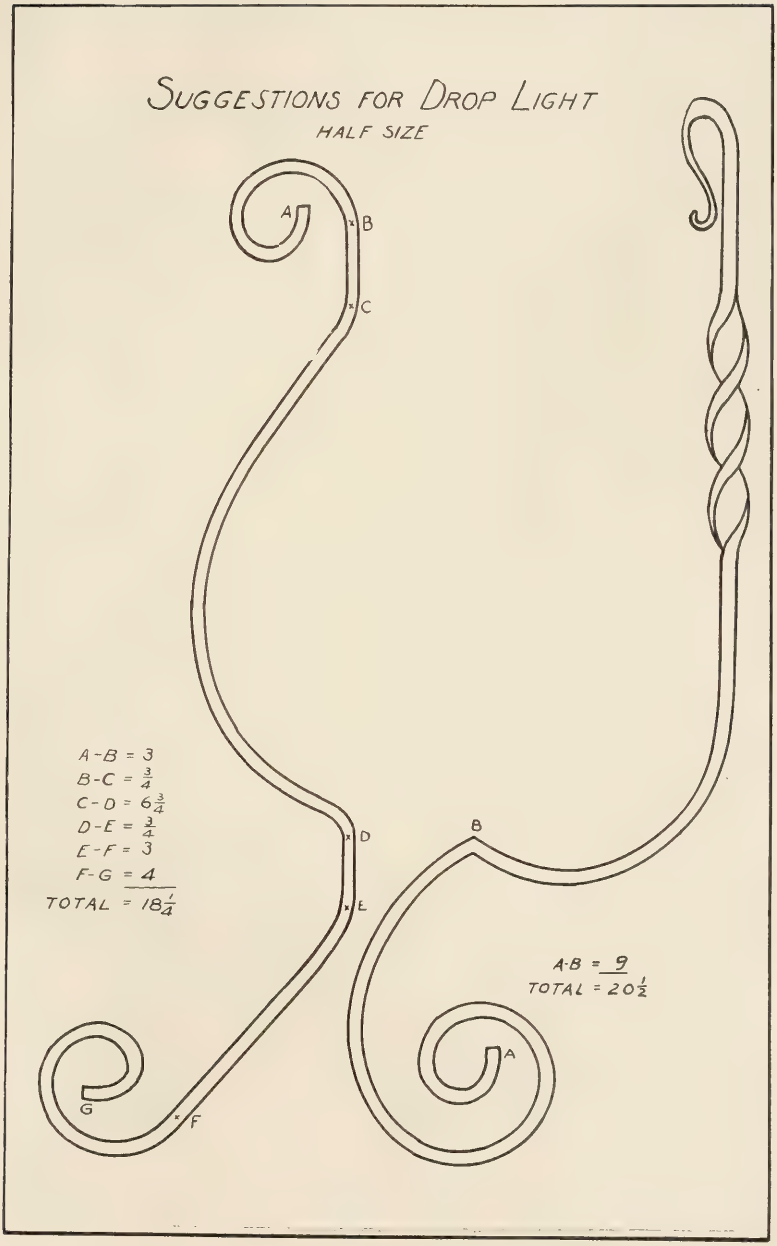
DYNAMO.

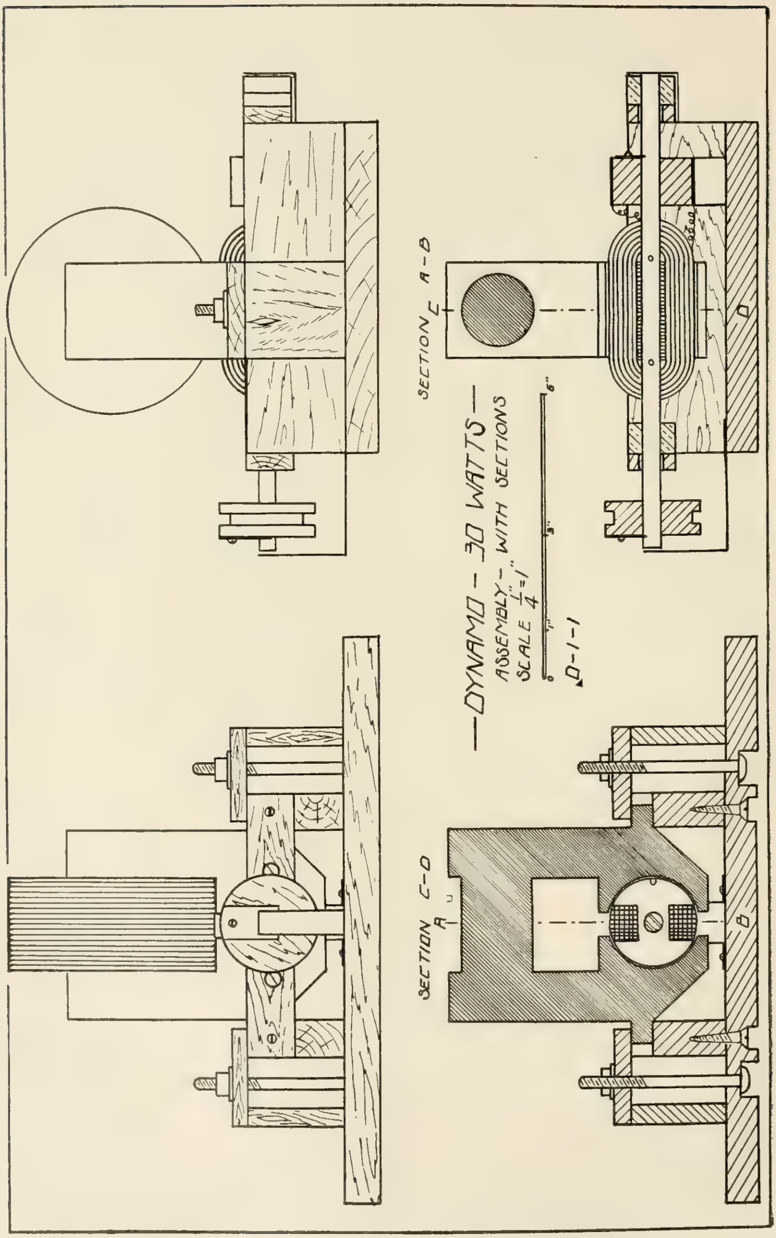
The boy who is interested in electricity and has no other source of electrical energy than some form of battery, will be glad to construct a dynamo from the drawings of R. L. Southworth of Minneapolis. The construction of the pattern for the fields is shown. The casting and in some cases the machining of the armature tunnel will have to be done outside the school. This field casting is supported upon two foundation strips which are secured to the base with 1¼-inch screws. To clamp the field in place, carriage bolts are used passing through the base and a horizontal tie piece which rests upon the fields at one end and a vertical tie piece at the other end. To construct the armature 27-gauge sheet iron is cut into 2-inch strips and the armature discs laid out as shown on the detail sheet, with 2 inches between the centers. The holes are first bored and then the discs cut to shape with the snips and a cold chisel, the edges finally being smoothed with a file. One side of each disc is coated with shellac to prevent eddy currents. 100 of these discs are then mounted upon a ⅜-inch steel shaft and held in position by a staple which fits into a notch on the edge of the discs and passes through holes

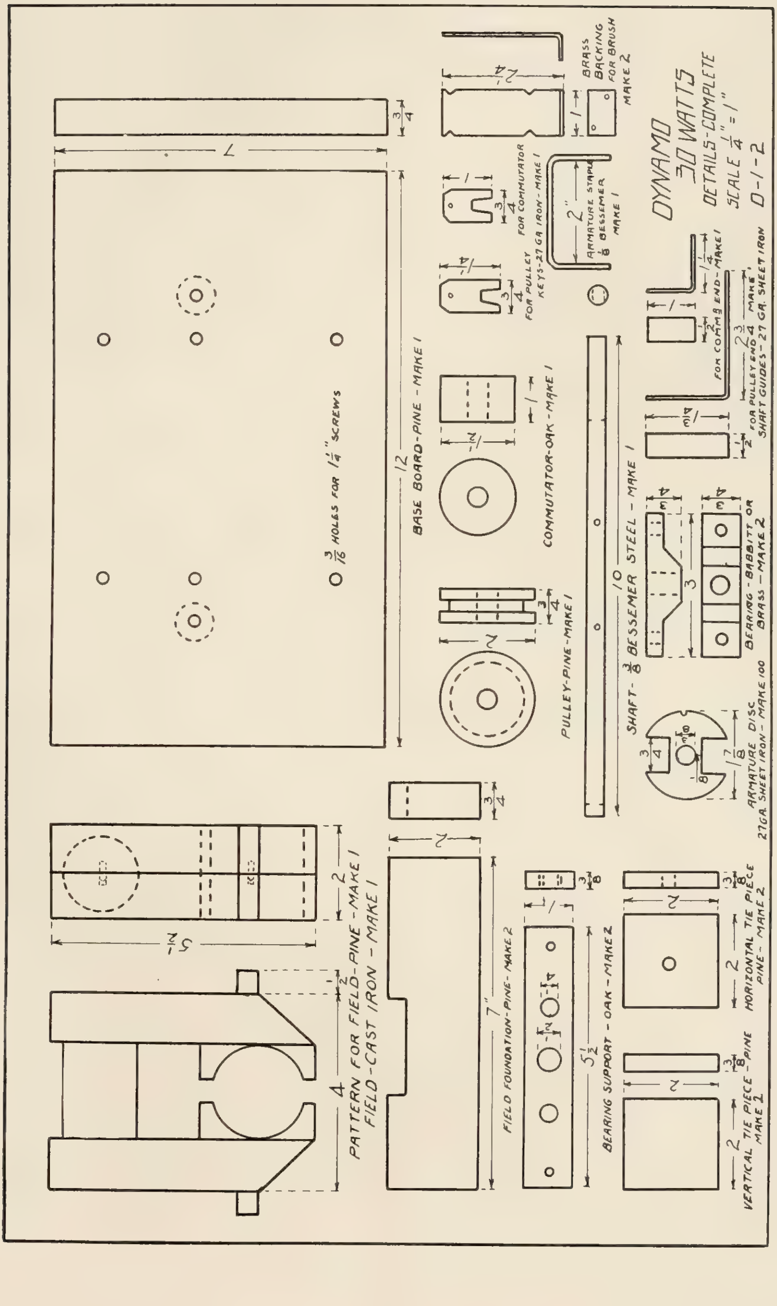


SERIES WINDING SHUNT WINDING COMPOUND WINDING ARMATURE CONNECTIONS

in the shaft. Before winding the armature slot with No. 19 double covered copper wire it is insulated with a covering of muslin. After the copper wire has been put in place, it is held in position by a layer of No. 24 annealed iron wire which also serves to reduce the air gap.


SUGGESTIONS FOR DROP LIGHT
HALF SIZE
A
B
C
D
E
F
G
A-B = 3
B-C = 3/4
C-D = 6 3/4
D-E = 3/4
E-F = 3
F-G = 4
TOTAL = 18 1/4
B
A
A-B = 9
TOTAL = 20 1/2


SECTION A-B
—DYNAMO – 30 WATTS—
ASSEMBLY – WITH SECTIONS
SCALE 1/4" = 1"
D-1-1
SECTION C-D


DYNAMO
30 WATTS
DETAILS-COMPLETE
SCALE 1/4" = 1"
D-1-2
BASE BOARD-PINE-MAKE 1
3/16 HOLES FOR 1 1/4" SCREWS
COMMUTATOR-OAK-MAKE 1
PULLEY-PINE-MAKE 1
SHAFT-3/8 BESSEMER STEEL-MAKE 1
BEARING-BABBITT OR BRASS-MAKE 2
ARMATURE DISC
27 GA. SHEET IRON-MAKE 100
PATTERN FOR FIELD-PINE-MAKE 1
FIELD-CAST IRON-MAKE 1
FIELD FOUNDATION-PINE-MAKE 2
BEARING SUPPORT-OAK-MAKE 2
HORIZONTAL TIE PIECE
PINE-MAKE 2
VERTICAL TIE PIECE-PINE
MAKE 1
FOR PULLEY END-MAKE 1
SHAFT GUIDES-27 GA. SHEET IRON
FOR COMM. END-MAKE 1
ARMATURE STAPLE
1/8 BESSEMER
MAKE 1
FOR PULLEY
KEYS-27 GA IRON-MAKE 1
FOR COMMUTATOR
BRASS
BACKING
FOR BRUSH
MAKE 2

The commutator is made of oak, upon the surface of which are fastened with brass screws two pieces of brass, the outside ends of the armature wires being held in place beneath the corresponding piece of brass. Both commutator and pulley are held in place on the shaft by sheet iron keys screwed to their sides and fitting into slots on the shaft as shown in the drawing. The brushes are made of brass gauze backed by pieces of sheet brass, which are shown on the detail sheet. The bearings for the shaft are made from babbitt or brass and L-shaped pieces of sheet iron prevent longitudinal motion in the shaft.

The fields are to be wound with No. 19 double cotton covered wire, first insulating the iron from the wire by a covering of muslin. The drawing of electrical connections gives three methods of winding which may be used, according to the work the dynamo will be expected to do. In case the dynamo is to be compound wound, the series wire which is shown blackest in the drawing consists of only two layers of No. 14 wire laid on top of the No. 19 wire. In the other windings about 2½ pounds of No. 19 wire will be needed for the dynamo. In case the dynamo is to be used to charge a storage battery a tri-polar armature must replace the bi-polar one shown, as otherwise the battery would be short-circuited.

In case no water motor or other source of power is available to run the dynamo, it will be necessary to construct a large handwheel about 27 inches in diameter by which it will be possible to produce the required speed of 2500 revolutions a minute.

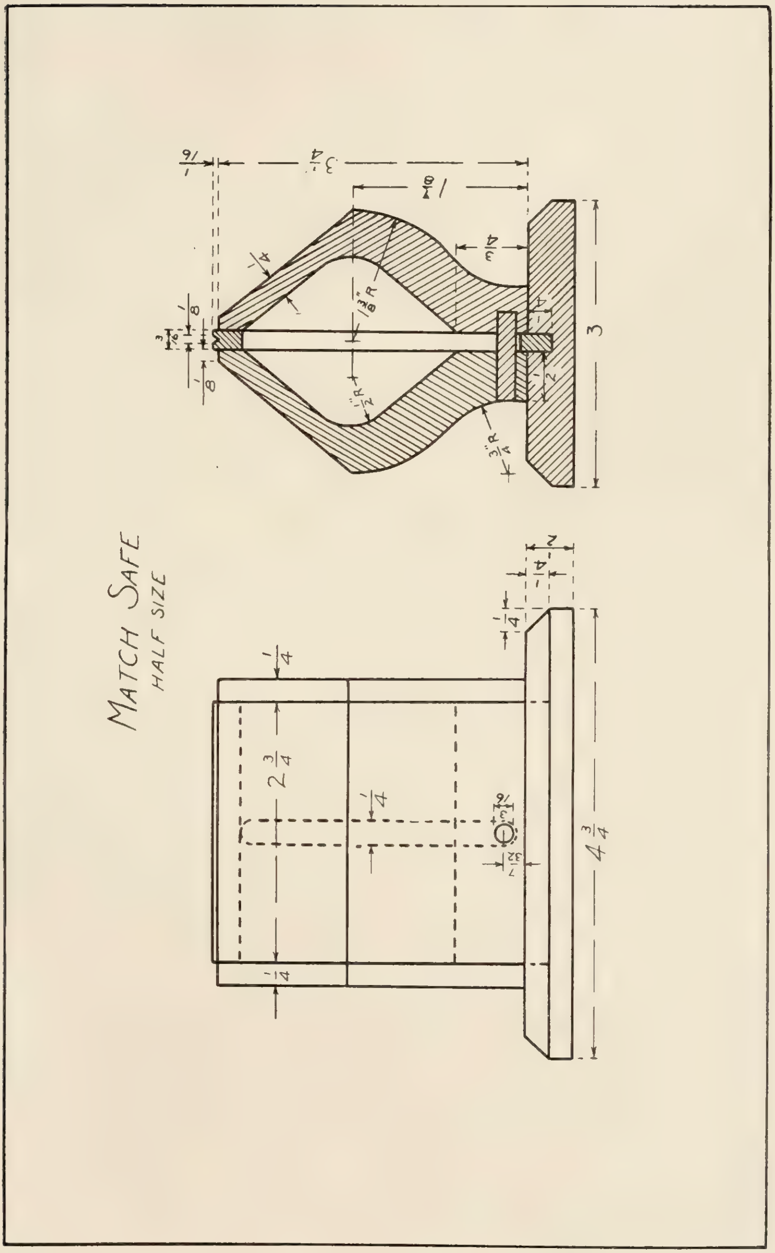
Sufficient enegry can be generated to operate an electric bell, telegraph, small electric motor, small electric railway, or a 6-candlepower, 10-volt electric lamp.

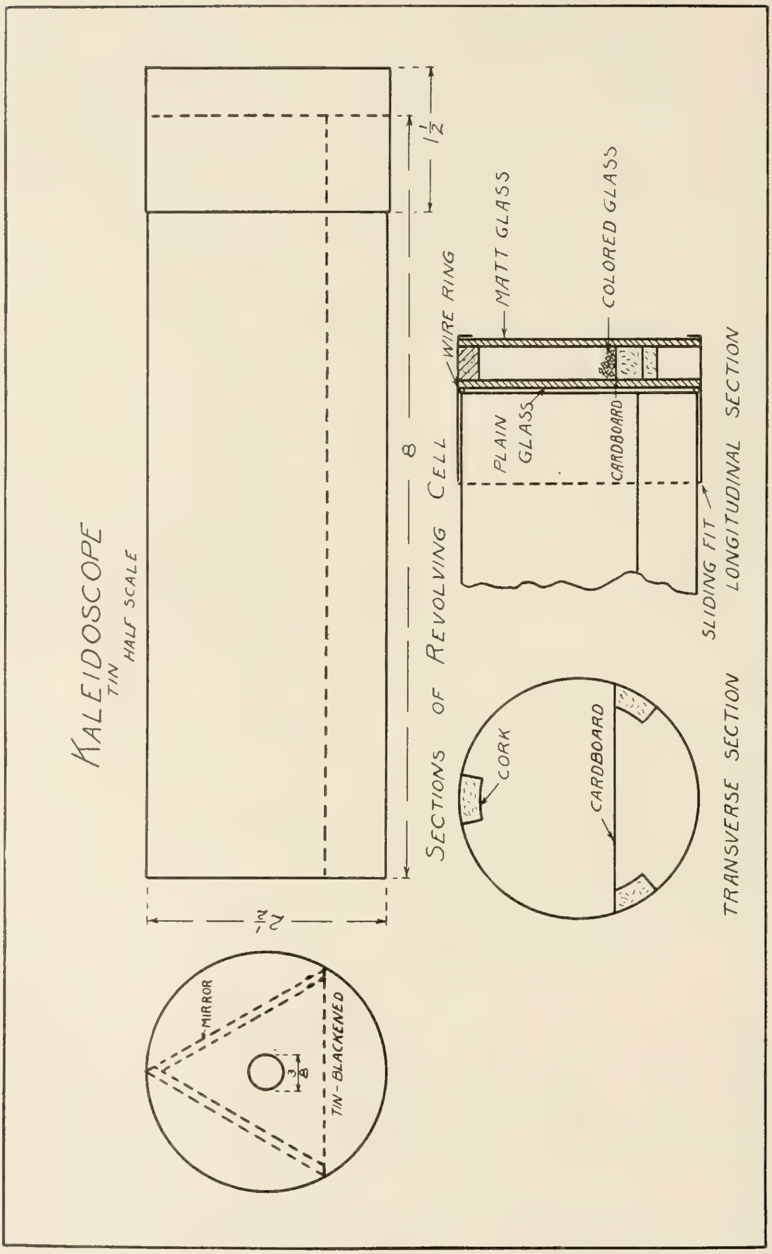
MATCH SAFE.

The unique operation of the match safe shown has interested the boys of Worcester, Massachuestts, for some six years since it was designed by W. G. Wesson. The drawing was sent in by Allison P. Ball. It consists of three parts, base, upright and sliding box. The upright is mortised into the base and the box slides up and down on the upright. The pin passing through both prevents the box from coming off. After filling the safe with loose matches through the opening at the top, the box is raised as high as it will go, which will allow one of the matches to take its place in the groove upon the upright. As the box is lowered into position again the upright carrying the one match comes into view, the other matches falling on each side of the upright inside the box.

KALEIDOSCOPE.

In the model of the kaleidoscope which was sent by Hans Schmidt of St. Paul, there is a hint of a line of work that might well be increased. It has merit where work in Venetian iron is weakest and the expense for material is much less than for material for work in sheet brass or copper. Its construction is easily understood, though it involves a few processes not familiar in many manual training schools.


MATCH SAFE
HALF SIZE


KALEIDOSCOPE
TIN
HALF SCALE
1 1/2
8
2 1/2
MIRROR
TIN-BLACKENED
3/8
SECTIONS OF REVOLVING CELL
WIRE RING
MATT GLASS
COLORED GLASS
PLAIN GLASS
CARDBOARD
SLIDING FIT
LONGITUDINAL SECTION
CORK
CARDBOARD
TRANSVERSE SECTION

CURRENT ITEMS

Clinton S. Van Deusen, Editor.

The progress made in forestry during the last ten years has certainly been remarkable. When however we take into consideration the fact that we are using as much wood in one year as grows in three and with only twenty years of virgin growth in sight we realize that vigorous action is necessary to prevent the starving of national industries for lack of wood. Our President and the governors associated with him are making vigorous efforts to help in the matter of forest preservation and manual training teachers should not forget that they have a field for helping along public opinion by discussing this matter with their pupils, our future citizens.

Mr. Thomas Speed, pardon attorney to the governor of Missouri, says: "About 75 per cent of felons are untrained in any honest or useful trade; most criminals are thieves; men, for the most part, who try to get a living dishonestly because they have not learned to get it honestly. They steal, who have not learned to work. An hour's hand work a day in every school room in the land, running through all the grades from the kindergarten to and including the high school, would give to every man, woman and child of the rising generation at least the rudiments of an honest, useful and profitable occupation; and would make of the next generation of Americans the most productive and the most industrially efficient race the world has ever seen. I believe that every criminologist will agree with me when I say that for every dollar so expended, two dollars will be saved in the lessened cost of crime.—*Educational Press Bulletin.*

There have been organized this year in the schools of Bangor, Maine, two new courses. One a technical course which prepares pupils for entrance to scientific and engineering courses in colleges. The other an industrial course which is intended for those who are not to enter college and will help to make them of greater value along industrial lines. Manual training is also given one half day each week to the training class for teachers. The work is in charge of Everett E. Goodell with Charles H. Sampson as assistant.

BOSTON.

The Sloyd Training School during the twenty years of its existence has been changed in location several times and it will soon be moved again into a special building that is being erected for it at Harcourt St. This building will have ample accommodations for the varied work of the school. The main rooms on the ground floor are for wood-turning, forging and metal work. On the second floor two well lighted and well ventilated rooms are provided for bench work; one will contain thirty benches for normal classes and the other twenty benches for children's classes. A lecture room and other smaller rooms will be on this floor.

This school gives a one year course for teachers and a two year course for high school graduates. Beginning in September, 1909, a tuition fee of $100 will be charged.

CLASS IN FRAMING—BRADLEY POLYTECHNIC INSTITUTE, PEORIA, ILL.

This class is applying their class instruction in constructing practice frames, involving the ordinary problems in house framing. In the illustration three frames are being constructed, after the same plans, by three divisions of the class. Each division is in charge of a member of the class acting as foreman and in general such suggestions as the instructor cares to make are given to him. The material used is full-sized, but short studs are used for economy of material and convenience of construction. The plan of the building is L-shaped and on the shorter and narrower leg of the L, the frame is for a hip roof thus requiring hip, jack, and two lengths of valley rafters. The hip framing is completed on the farthest frame but its details are not shown clearly in the illustration. After the frames have been completed, they are torn down and the lumber used in teaching wood-turning.

Two new manual training rooms for elementary work in Boston Schools have been established; one in the new Francis Parkman District, Forest Hills, and the other in the Bunker Hill School, Charlestown.

The Evening Drawing Schools have been reorganized under the name of the Boston Evening Industrial School, so as to come in under the provisions of the Massachusetts Industrial Commission. There is a central school in the Mechanic Arts High School Building, with branches in the Public Latin School Building, South End; Old City Hall, Charlestown; Old High School, East Boston, and Old Dearborn School, Roxbury. Frank M. Leavitt is the principal. In addition to carrying on the work of the ordinary evening drawing school, there are departments of design and illustrative work, drawing from life for men, machine tool and jig making, and a class in steam engineering to enable firemen to secure engineers' licenses.

A one year course in manual training, under the head of bookbinding, is now quite fully established throughout the city in the fifth grades. It is a logical sequence to the cardboard work of the fourth grade.

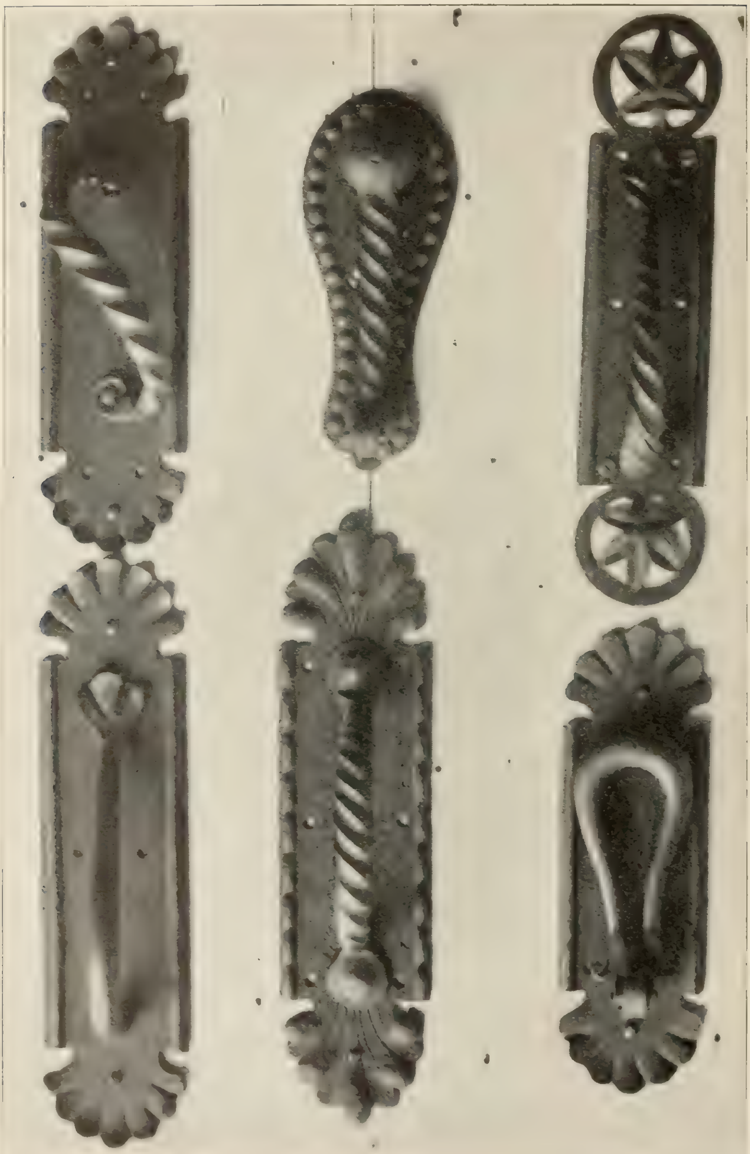
The School of Printing, operated by master printers of Boston, is conducting a series of appprenticeship lectures, given by men having practical knowledge along the various lines considered. The dates and subjects are as follows: Nov. 4—"The Printer and His Apprentices;" Nov. 17—"A Practical Talk on Presswork;" Dec. 1—"Stone Work and Imposition;" Dec. 15—Paper; Its Composition and Manufacture;" Dec. 29—"Composing-Room Wrinkles;" Jan. 12—"Design in Printing;" Jan. 26—"Press-Room Wrinkles;" Feb. 9—"The Printer as an Advertiser;" Feb. 24—"A Knowledge of Drawing—An Important Asset;" Mar. 9—"How the Outside World Judges Printing."

Employers are urged to grant their apprentices time to attend these lectures, and foremen are requested to require apprentices to make reports to them. Note books are distributed gratis, so that notes of the lectures may be made by apprentices in a systematic manner. Special tickets of attendance are issued to employers, properly dated and numbered, that they may be punched at the door in order to check attendance of apprentices.

An Industrial Exhibit was held at Buffalo, N. Y., lasting from December 13 to December 19. A large part of the floor space was given up to the Technical High School. Exhibits of work done in the schools and lathes and benches manned by relays of students in continuous operation throughout the week attracted the attention of the thousands of visitors. The affair was promoted and carried on by the Manufacturers' Club of Buffalo.

Under the direction of Wm. R. Ward, the new supervisor of manual training at Trenton, N. J., the work has been considerably extended this year. An entirely new equipment has been installed in the high school, the old equipment being transferred to one of the grade schools. J. Louis Crisp, an expert patternmaker and student at Drexel Institute, has charge of the high school work. The work in domestic science and art is also being extended under the direction of Miss Louise Kingsbury.

A new class in advanced ceramics has recently been started at the School of Industrial Art at Trenton, N. J., with Gustav Heinz, a ceramic chemist of international reputation, in charge. This means much to the pottery industry of Trenton from an educational view point.



MADE BY STUDENTS UNDER THOMAS GOOGERTY IN THE ILLINOIS STATE REFORMATORY, PONTIAC, ILLINOIS.

WASHINGTON, D. C.

The first extension to the McKinley Manual Training School was completed last summer and equipped during the fall. This provides an assembly hall, library, new wood shop, new steam and electrical laboratory, four new rooms for the department of freehand drawing and design, an additional physics laboratory and office, a lecture room for physics, and additional class rooms. It doubles the space assigned to domestic art and greatly increases the forge shop, machine shop and engine room. A tandem-compound engine, 150 H. P., coupled to a 100 K. W. generator has been added to the power equipment. Boilers of 150 H. P. have been added to the boiler capacity.

The new wood shop has been equipped with thirty-six motor head lathes and with motor driven double saw bench, band saw, water emery grinder, and grindstone. There will soon be added bench space for fifteen students, with rapid-acting vises. The forge shop will be enlarged to include thirty down-draft forges. The facilities of the machine shop will be increased about fifty per cent by the installation of additional lathes, shapers, milling machines and grinders, all motor driven. The stock and tool rooms of this shop have been equipped with metal shelving and racks.

Work upon the second extension to the building has commenced. This will provide additional class-rooms, and greatly improved facilities for mechanical drawing, domestic science, and art metal work.

The growth of the school has been, and continues to be, so rapid that the building, with both these extensions, will fall short of adequately housing the pupils. Therefore, the Board of Education is asking Congress for an appropriation for additional ground and for a further extension to the building. Up to the present time the appropriations for site, building and equipment have aggregated $540,000.

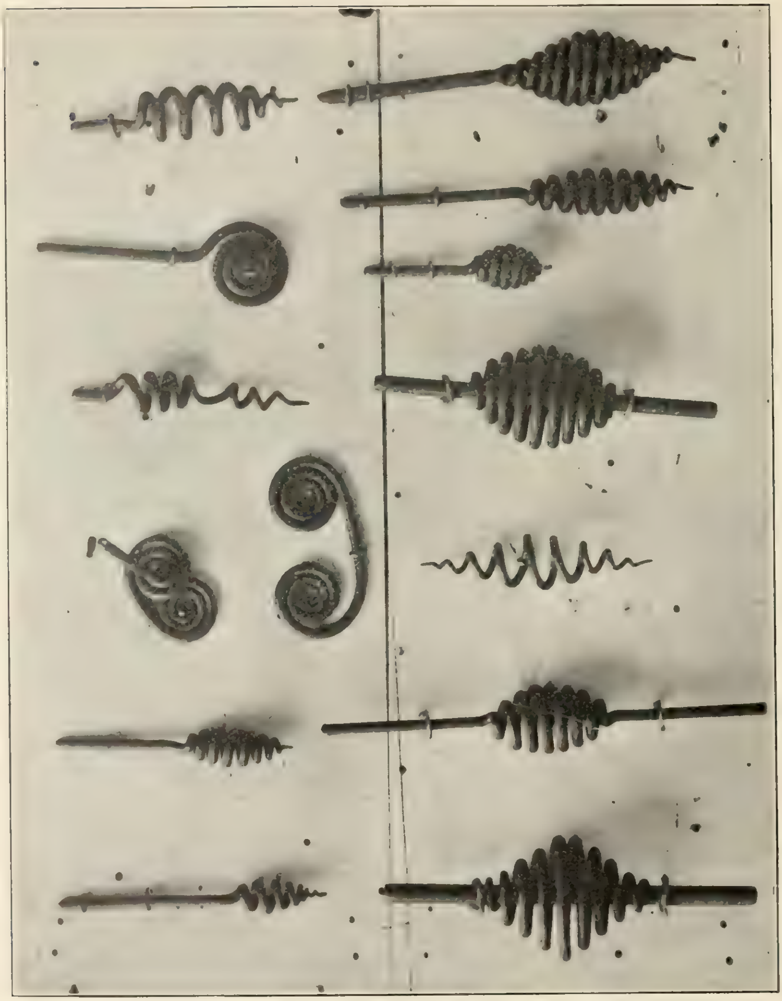
The Armstrong Manual Training School is also outgrowing its building and, with the addition to its original site, will soon be enlarged.

The work of the grammar school shops is undergoing revision and particular attention is being given to manual training for the ungraded and atypical classes.

TEXAS.

Two new manual training and domestic science centers have been opened in Houston. One in a new white school and the other in the colored high school. This makes nine centers in Houston. The departments of manual training and domestic science entertained H. A. Landis and B. Adoue of Galveston some time ago. Mr. Landis is the mayor of Galveston and Mr. Adoue a prominent citizen. They were shown about among the different centers and finally treated to a banquet prepared by the pupils of the high school domestic science classes. They were so enthusiastic about the value of manual training and domestic science work that Mr. Adoue offered to equip and maintain a center for these subjects at Galveston at his own expense.

Sherman has recently installed equipment for manual training and domestic science in the new high school building.



MADE BY PUPILS UNDER THOMAS GOOGERTY IN THE ILLINOIS STATE REFORMATORY, PONTIAC, ILLINOIS.

El Paso is making a very energetic start in manual training under the direction of E. A. Ross. At first it was planned to start the work in all the grades and the high school this year but it has been thought best to delay starting high school work until a new high school building can be built. This is giving a good opportunity for developing the courses in the grades. DeWitt C. Cole and George D. Henck have charge of the grade work centers; Miss Henning has charge of the primary manual training work; Miss Coleman has charge of the sewing with Miss Morrison and Miss Kingwell as assistants and Miss Cora Schwarz is head of the domestic science department.

Harris County has taken a step in the right direction by putting construction work in the rural schools. Miss Laura B. Peck, primary supervisor of the Houston schools, has been secured to supervise the work.

OHIO.

Bench work for the sixth grade met with such success last year in Cincinnati that it is being taught in all centers this year. Industrial work has also been extended to the second year of the high school, the board having appropriated $5400 for that purpose. Another event of interest in Cincinnati this year was the opening of the First District School with its large rooms for manual training and domestic science.

Three new grade centers for seventh and eighth grade work have been opened in Cleveland this year.

Work in manual training is advancing rapidly at Piqua. A wood-turning and pattern-making shop was added this year with an equipment of twenty-one lathes, an emery grinder and circular saw. James E. Dongan is in charge of the work. Domestic science has also been added this year with Miss Agnes Smiley of Ohio State University in charge.

ILLINOIS.

The department of household science at the University of Illinois has rented a large dwelling house near the campus and divide it into two equal apartments. One of these is fitted up in every respect according to the most improved methods and theories of household economics. The other is furnished according to the good old way of our grandmothers. The one is modern in every respect; the heating is done by gas and electricity; the preparation of foods and the laundry work are accomplished by electricity; the floors are varnished or waxed and covered with rugs. In the other hard and soft coal, wood and coke are used to heat the rooms as well as for cooking purposes. Oil lamps are used to illuminate the place, the water is drawn from a pump, and carpets are tacked to the soft pine floors. The problem to be solved is to find out how far a person of limited means can adopt the modern way of housekeeping. Classes in household science have charge of each of the apartments under the supervision of the professors. A careful account of the expenses, the convenience, and the time consumed in the preparation of foods and the discharge of all the other domestic duties is to be kept. The experiment will last one year and should result in securing some valuable information.

Moline, an important factory town of Illinois, is making rapid progress in manual arts. On December 8th and 9th a new manual arts building was formally opened to the public with all departments in operation. The building is plainly constructed of blue brick trimmed with white brick. It is made in the form of the letter H and its extreme dimensions are ninety feet by one hundred fourteen feet. The main part is two stories high and the wings one story. The cost of the building with separate heating plant (which also heats an adjacent grade building) and equipment was only $29,000. This was made possible largely by utilizing student labor in making the plans, lockers, benches, domestic science tables and several machines such as lathes and drill presses. The students also did the electric wiring, installed the machines, etc. The building provides for woodwork for the seventh and eighth grades and for pattern work, forge work, machine shop work, freehand and mechanical drawing for the high school. It is also well supplied with office, toilet and store rooms and contains a gymnasium thirty-four feet by sixty feet with $500 worth of apparatus. There is also a room which will be equipped later for foundry work. H. S. Dickinson is principal of the school, while H. P. Corbin is instructor of seventh and eighth grade work and shop assistant. Miss Eva Pratt has the freehand and mechanical drawing classes, Mrs. C. W. Gleason the domestic science classes and Mrs. M. K. Vinton the sewing classes.

Plans are well under way for a new manual training high school that is to be erected in the near future at Grand Rapids, Mich. Two hundred and fifty thousand dollars are now available for the erection of the building, which will accommodate fifteen hundred pupils. The plans call for an E-shaped building three stories high. In addition to the usual class rooms it will contain an auditorium and gymnasium and liberal provision will be made for the shops and other rooms desirable for the manual training work. Domestic science and art will also be well provided for.. This building is to take the place of the present Central High School which will be converted into a grade school and will contain a manual training center. An addition is also being made to the Union High School to provide for the manual training work of that school.

Manual training has been introduced in Poynette Academy at Poynette, Wis., this year, with W. G. Frye as supervisor of the work.

Manual training has been started in several places in Minnesota this year, among them being Montevideo, Olivia, Sleepy Eye, and Lake City. Red Wing and Hastings have made additions to their equipment and Minneapolis has opened five new grade centers and also started work in the new West High School.

For the past five or six years manual training work has been carried on in the upper grades of the schools of Helena, Mont., but this year the work has been extended to include all the grades and the high school. Last year a new building costing $36,000 was erected for a gymnasium and manual training shop for the high school and each of these departments has been provided with about $2,000 worth of equipment. At present this shop is equipped for benchwork and mechanical drawing only, and about eighty pupils are taking the work. Forty of these are first year boys who are required to take the work, twenty are advanced boys and twenty are advanced girls who have elected to take up the work.

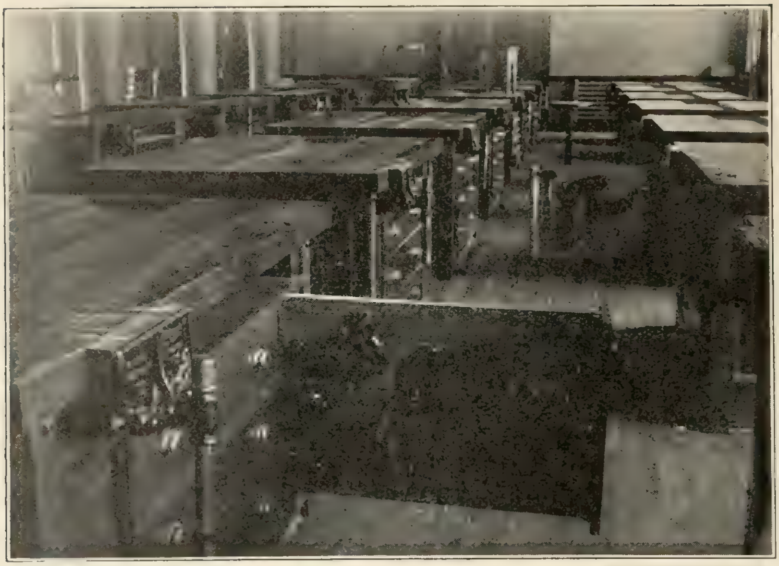
Nearly four hundred grade pupils are taking work in the old shop. The work of the city is under the supervision of J. W. Curtis, who also gives the instruction in the high school and highest grades. Miss Grace Owen gives most of the instruction in the other grades.

The manual training equipment in the high school at Walla Walla, Wash., has been increased this year by the addition of an electric motor, band saw, and lathes. Manual work is also given in all the grades, the last three taking up woodwork. James R. Forden is in charge of the work.

Dr. James A. B. Sherer, formerly President of Newberry College, S. C., has been elected president of Throop Polytechnic Intitute, Pasadena, California. Dr. Sherer has been for some years at Newberry and during his administration succeeded in doubling the attendance and greatly increasing the endowment. Previous to assuming his duties at Newberry he was engaged in educational work in Japan, and is the author of several books, some of them dealing with the life and history of the Japanese people.

Dean Arthur H. Chamberlain, who served fifteen months as acting president, has returned from Europe, where he spent the summer in a study of industrial and technical education. During Mr. Chamberlain's administration a splendid site of twenty acres was purchased, and here, in the near future, will be built the new Throop. During this time also an eminent architect was selected and plans are now being prepared. It is proposed to build an educational institution that, with no traditions to hamper it, will embody not only the industrial and technical phases of education, as embodied in high, normal and engineering school courses, but also such cultural subjects and humanities as to produce men and women of the broadest possible training.

TABLE MADE BY STUDENTS IN SUMMER SCHOOL, WOODSTOCK, VERMONT.



THESE WORK BENCHES WERE DESIGNED AND ARE USED BY W. R. BRADFORD, CALUMET, MICH. ONE UNIQUE FEATURE IS THE TOOL RACK WHICH RUNS ON ROLLERS AND IS EASILY MOVED IN OR OUT.

THESE DRAWING TABLES WERE DESIGNED AND HAVE BEEN USED, WITH SUCCESS, FOR SEVERAL YEARS BY W. R. BRADFORD OF CALUMET, MICH. THE CENTER OF THE TABLE ONLY IS TILTED THUS LEAVING ENDS LEVEL FOR INK BOTTLES, ETC.

REVIEWS

Book of Alphabets. By H. W. Shaylor. Ginn & Co., New York, 1908. 6½ x8 in.; paper; pp. 24; list price, 10 cents; $1.00 per dozen.

A variety of alphabets is offered including standard Roman forms, French script, old English, German, Gothic, outline, italic, skeleton, etc. This is a copybook and the arrangement is such that on each page beneath the copy a blank space is provided in which the student reproduces the letters.

In addition to the alphabets there are several pages of application of letters in title-pages, headings and illuminated texts, and one page of monograms. There are three pages of text. —W. T. B.

The Parallel Course Drawing Books. By C. S. Hammock and A. G. Hammock. D. C. Heath & Co., New York. Each book, 8x10¾ in.; paper; pp. 40; price, $1.80 per dozen.

There are four books in the series. Every lesson in each book is planned to be executed with pencil but as it is not intended to exclude brush drawing with ink or water color the books present *parallel courses* in pencil and brush drawing. Each book contains directions for the teacher and pupil and blank pages on which to mount the best work.

The introduction states that "by the use of the illustrations as a guide to good technic, and the instruction on each page as a method of procedure, any teacher who will devote the same amount of preparation to this subject that she does to the others in the curriculum will be able to secure reasonable and satisfactory results."

The drawings and the printing are well executed and the color plates very satisfactory. The directions include the making of a few articles, such as booklet, blotter pad, etc. —W. T. B.

The following have been received:

Quarterly Bulletin of the Lake Placid Conference on Home Economics. It contains the program of the meeting of the Teachers' Section and the Committee on Organization, Washington, D. C., December 31 to January 2; annotated bibliography of home economics; also notes on equipment. The Bulletin is accompanied by a circular announcing plans for the organization of an American Association of Home Economics at the Washington meeting. Address the Secretary, Benjamin R. Andrews, Teachers College, N. Y.

Sloyd Record, No. 11, *November,* 1908. Contains biography and portrait of Otto Salomon and report of a trip to India in the interest of Sloyd by Gustaf Larsson. Several illustrations. Published by the Sloyd Training School Alumni Association, Boston, Mass.

The Brief of the American Free Art League in Favor of the Removal of the Duties on Works of Art. Submitted to the Ways and Means Committee,

Washington, D. C., November 28, 1908, by the Executive Committee of the League. A pamphlet of about 250 pages containing the League's argument for putting art on the free list, and nearly 1,000 short arguments from college presidents, artists, dealers, officers of museums, and the press. Edward R. Warren, Secretary, Boston, Mass.

Bulletin No. 1, *November,* 1908. The American Federation of Teachers of the Mathematical and Natural Sciences. A general statement of the policy and purposes of the federation, which, though only recently organized, has over 1,000 members and is rapidly growing. C. R. Mann, Secretary, University of Chicago.

Self-Education in Mechanical Subjects. The first number of a periodical to be issued occasionally by the publishers of *Machinery,* The Industrial Press, 49 Lafayette St., New York. A small pamphlet containing notes on machine shop operations, book notes, etc.

Cutting Timber on the National Forests and Providing for a Future Supply. By Raphael Zon and E. H. Clapp. Reprint from the Yearbook of the United States Department of Agriculture. for 1907.

Progress of Forestry in 1907. By I. R. Craft. Reprint from appendix of Yearbook of United States Department of Agriculture for 1907.

National Society for the Promotion of Industrial Education, Bulletin No. 7. Dr. James P. Haney, Secretary, 546 Fifth Avenue, New York City. This is a circular of information containing the constitution of the Society, a list of the state branches, officers, members, etc.

Report of the United States Commissioner of Education, Volume I, 1907.

The Sloyd Record. Volumes I, II, and III bound in boards. Published by the Sloyd Training School Alumni Association, Boston, Massachusetts.

VOLUME X. NUMBER 4.

MANUAL TRAINING MAGAZINE

APRIL, 1909

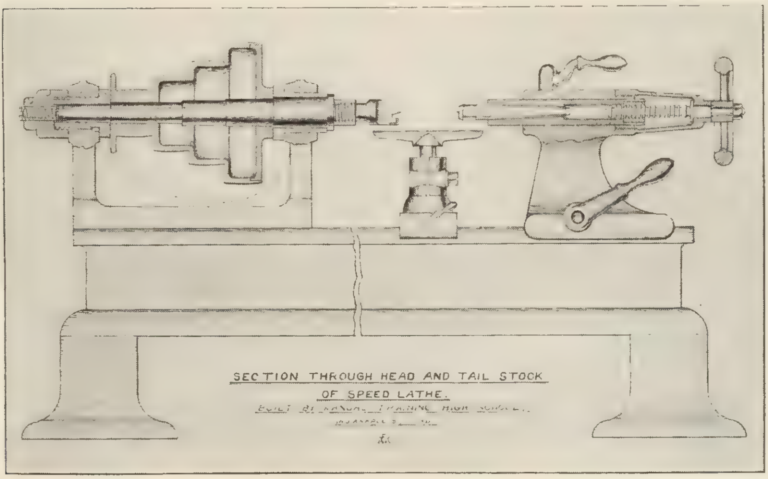


FIG. 1.

A COLLEGE CREDIT COURSE IN MACHINE SHOP WORK.

PAUL W. COVERT.

SINCE a number of the institutions of higher education are willing to recognize high school work in manual training under certain conditions, the question which arises in this paper is: What shall constitute a college credit course?

Owing to the fact that the machine shop depends largely on the foundry, and the foundry on the pattern shop, and the pattern shop on the mechanical drawing, it is essential to choose a course that will keep the departments in close relation. To do this, it is well that some school equipment be made by the class in the machine shop. Following out the above scheme, the pupil in the machine room has a knowledge of all the various operations necessary to the construction of a machine, and at the same time, the department is making itself useful to the

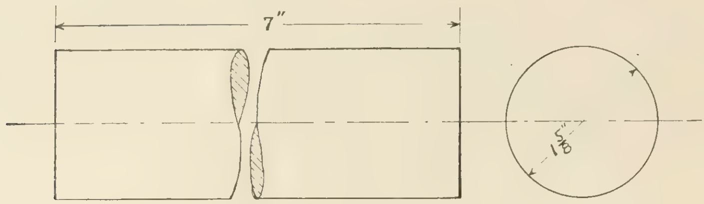


FIG. 2.

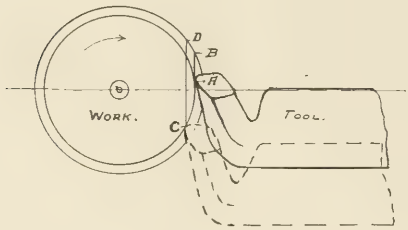


FIG. 3.

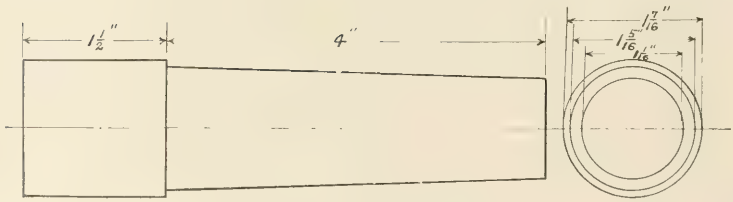


FIG. 4.

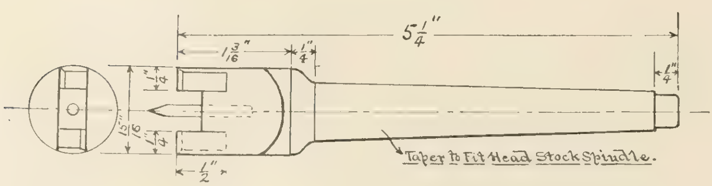


FIG. 5.

school. The course must be so arranged as to bring into use all the commonly used machines, such as the engine lathe, milling machine, planer, shaper, and drill press, going first from the simple to the more complex uses of the machine. In order to fulfill the above conditions, it is well to select the simple parts of some machine to serve as the elementary exercises. A wood-turning lathe, Fig. 1, of the proper design, furnishes a good example on which to work out a course. Care must be taken by the instructor not to lose sight of the educational side of the subject by having too many jigs and templets for the pupil to work by, thus eliminating the use of the calipers and other measuring instruments, and producing quantity rather than quality. .

In beginning the course in machine fitting, the first shop period can be spent profitably by the pupil in learning to oil and care for the machine. After he becomes familiar with the uses of the different levers, screws and feeds, he may be given the simplest exercise possible whether it be on the planer, milling machine, shaper or lathe.

All of the practical part of the elementary work must be preceded by lectures, such as the pupil can understand, covering the theory and describing the work of the course as it is taken up. These lectures must be well illustrated by sketches and the pupil required to keep a notebook, which is to examined from time to time by the instructor and considered when giving grades. Some of the more important points that should be emphasized in the lectures are: theory of metal-turning, centering, methods of driving the work, forms of cutting tools and tool grinding, methods of measuring, turning cast-iron, steel and brass, taper turning, chuck, reamer, face plate and mandrel work, use of oil, relation of speed to heat developed, thread cutting, gear cutting, bolts as fastening devices, different kinds of fits in machine shop practice, and files and filing. Only a few of the above points will be emphasized in this paper.

In discussing the theory of metal-turning, the cast-iron cylinder, Fig. 2, makes a good exercise for the beginner on the engine lathe.

Fig. 3, which shows the end view of Fig. 2 in the lathe, illustrates how the strain on a tool can be varied by setting it high or low. If the tool is set high, the downward pressure on it is equal to the shearing strength of the metal of the cylinder from A to B. If the tool is set low, the downward pressure is greatly increased as shown by the line C. D., yet both are cutting the same depth.

Taper turning may be illustrated by the exercise shown in Fig. 4, and the different methods, as setting over the dead center, by use of the taper attachment and the compound rest fully explained. The live cen-

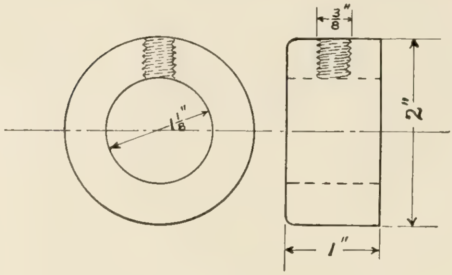


FIG. 6.

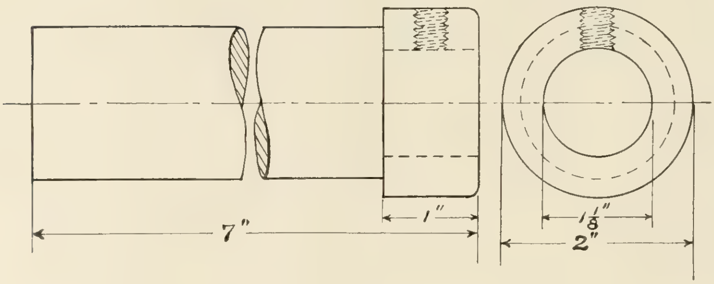


FIG. 7.

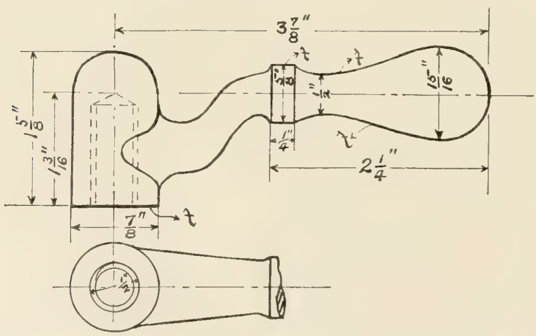


FIG. 8.

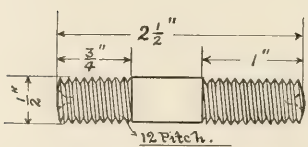


FIG. 9.

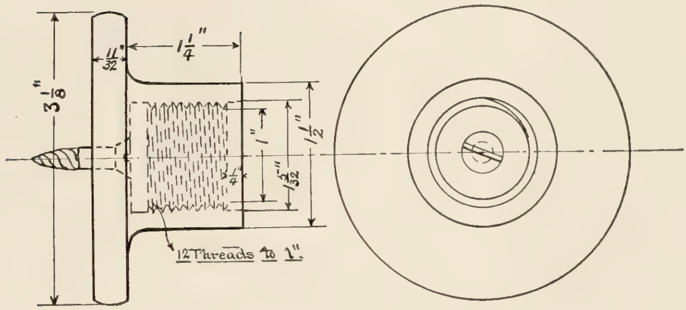


FIG. 10.

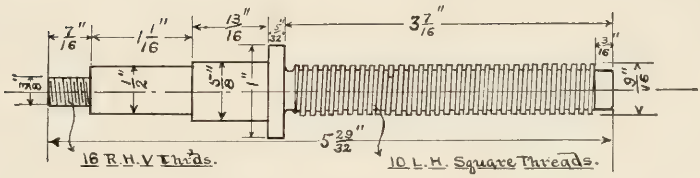


FIG. 11.

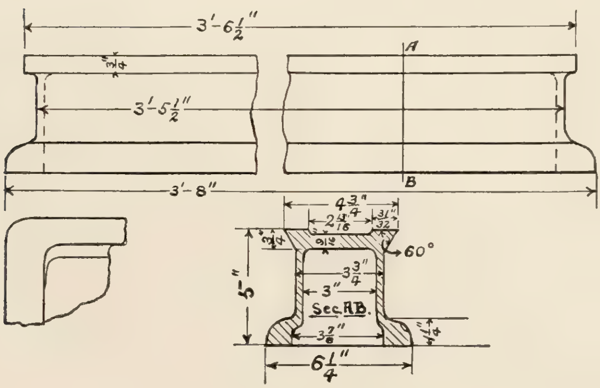


FIG. 12.

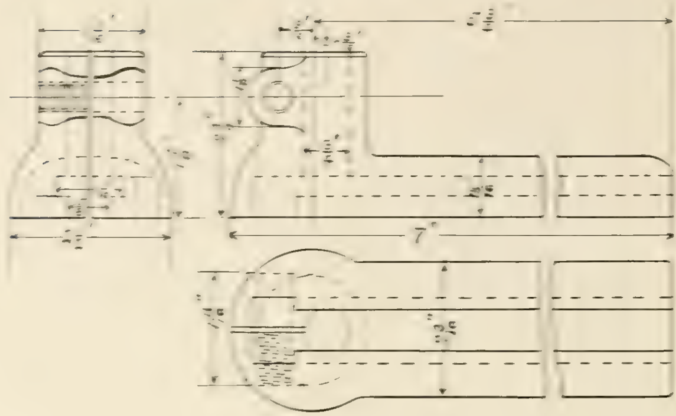


FIG. 13.

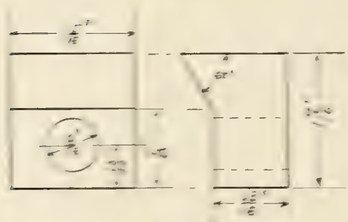


FIG. 14.

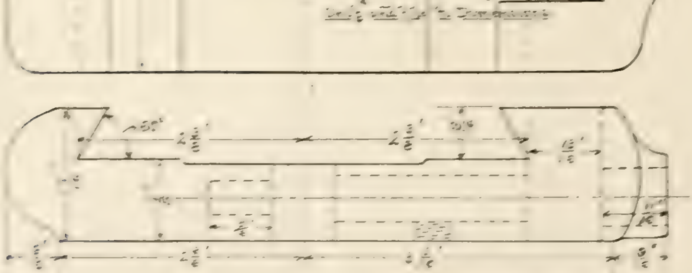


FIG. 15.

ter, Fig. 5, of the wood-turning lathe, furnishes a good example of the more advanced taper turning and also a simple milling machine and filing exercise.

The one inch cast-iron collar, shown in Fig. 6, is for use on the counter shaft of the lathe. This is the simplest exercise in the use of the chuck, boring tool, hand reamer, and mandrel. In tapping out the hole for the set screw, the attention of the pupil should be called to the machinist's hand taps and dies and their method of cutting threads.

In order to give the pupil a little practice in making a running fit, and not take too much time, the seventh problem, shown in Fig. 7, may consist in turning down one end of the first exercise and fitting it to the one inch collar just finished. At this place in the elementary work, it is well to take up and thoroughly explain the different fits common in machine shop practice, as running, driving, shrink and force.

For free hand and form turning on the engine lathe, the clamping handle of the wood-turning lathe shown in Fig. 8 makes a good problem.

Fig. 9 shows the simplest exercise in thread cutting on the engine lathe. It is the clamping screw for the tail stock spindle and is followed by the more difficult pieces shown in Figs. 10 and 11.

Parallel blocks of given dimensions serve as good and useful elementary exercises on the planer, shaper, and milling machine. For an advanced problem on the planer, the lathe bed, Fig. 12, is satisfactory. Also the legs for the bed and the bottom of the headstock serve as good exercises.

The tool-post, Fig. 13, works out nicely on the shaper, and, at the same time, illustrates the method of cutting a T slot on that machine.

The clamping block, Fig. 14, of the tool post slide, makes a good exercise on the milling machine to show the use of the simple and angular milling cutters.

Chipping and filing must not be entirely overlooked, even though the improved machinery found in the modern shops does away with much of the handwork. The castings of the lathe as they come from the foundry require more or less chipping and filing before the machine is assembled.

The tool-post slide, Fig. 15, furnishes a good problem in laying out, chipping, filing and milling.

All pupils will not progress at the same rate. Some may only complete the prescribed exercises in the elementary work, but good and accurate work should be insisted upon. In a course as suggested by the

writer, it is very evident to the pupil, that if his work is inaccurate and below standard, it will not fit with that of his fellow classmates when it comes to assembling the lathe, or other machine; that is the basis of the course.

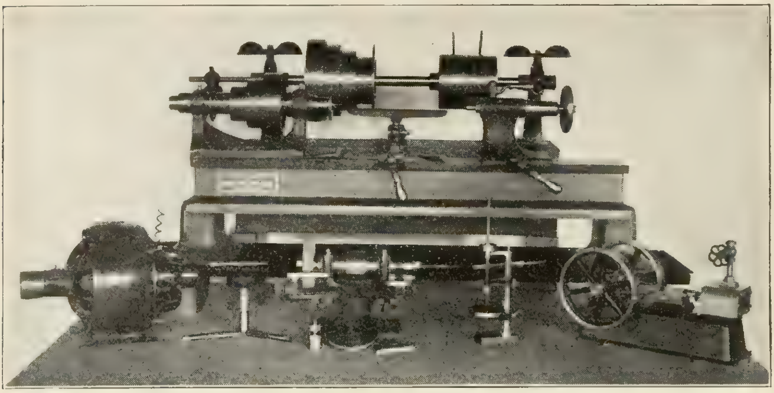


FIG. 16.

Pupils having ability in this line of manual training will accomplish much more than the elementary work and they should be encouraged to take up the building of some special machine, as a gasoline engine, electric motor, small lathe, or whatever appeals to their mechanical genius, provided it is within their ability and the capacity of the equipment; this the instructor must decide. If in the advanced work there are some pupils who do not care to build some special machine for themselves, they should be given the larger and more difficult parts of the wood-turning lathe to make. These to be used with the smaller pieces already made as exercises and a machine assembled to add to the school equipment. The lathe and drill press shown in Figs. 16 and 17, were made in that way in the In-

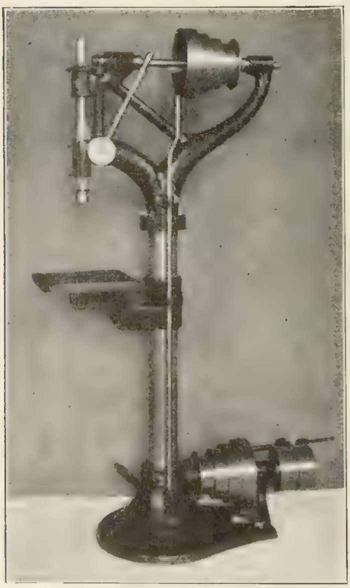


FIG. 17.

dianapolis Manual Training High School. The other machines, as gasoline engine, steam engine, jack screw, electric motor, emery grinder, etc., are individual problems of the pupils.

In conclusion I will say it is essential that a machine fitting course for college entrance credit, must be carefully planned with a definite view in mind, and that the proper amount of lecture and notebook work be carried on in connection with the practical part. The pupil should never be left to find out for himself the proper ways of using a tool. Correct methods must be clearly shown and explained and class demonstrations followed up by individual instruction to keep the pupil from multiplying his mistakes. The following out of such a course as set forth, seems well worth a credit in college, and at the same time will serve equally well for general educational purposes. The pupil who finds pleasure in the work and decides to enter a machine shop, will appreciate the foundation laid in the school where his ability to think and execute was, no doubt, greatly increased.

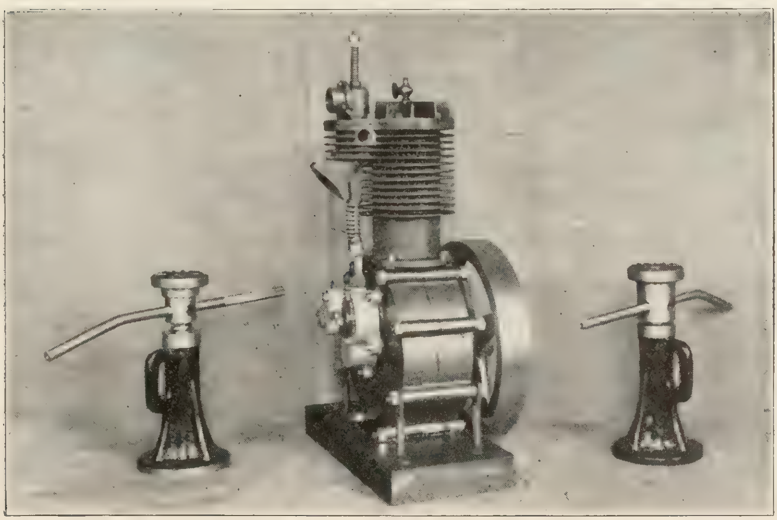
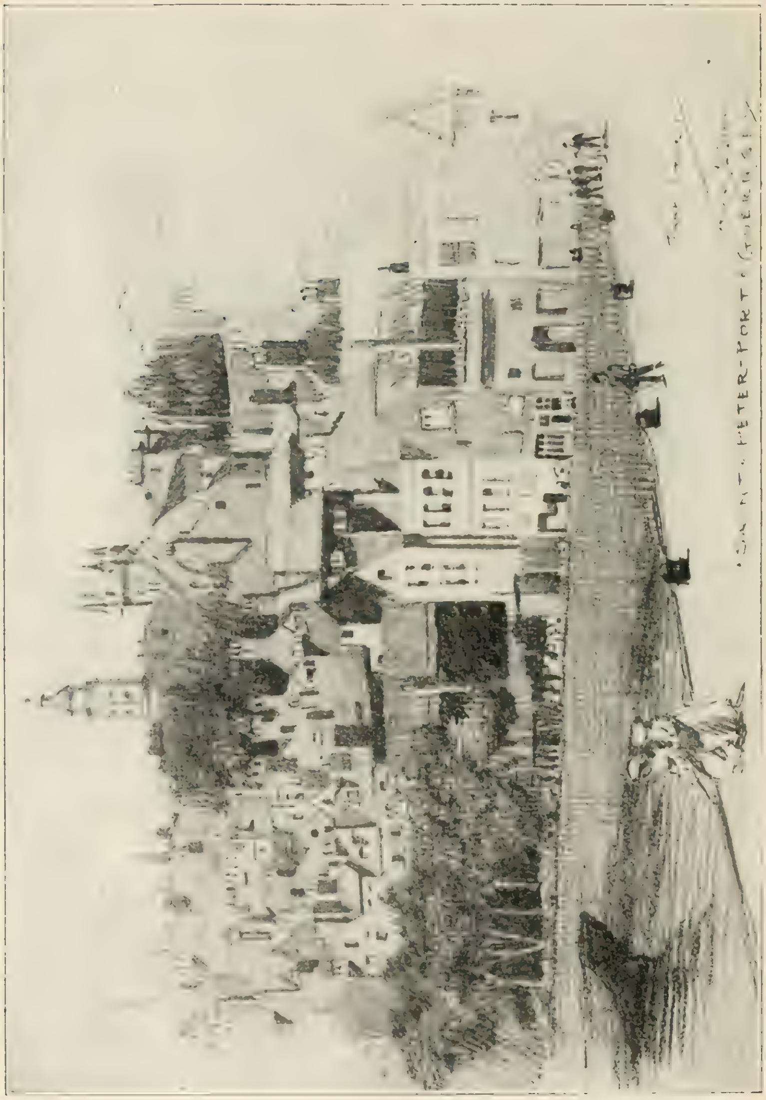


FIG. 18.


PETER-PORT

SKETCHES FROM GUERNSEY AND ST. MALO.

Frank Leighton Crerie.

A COMFORTABLE midnight steamer leaves Southampton for the quaint little island of Guernsey, lying one hundred and sixty miles from England and off the coast of France. This island is unfrequented by tourists, and so modern hotels and fashionable dress are unknown there. But lovers of the picturesque find an eighteenth century community with customs and buildings quite unchanged.

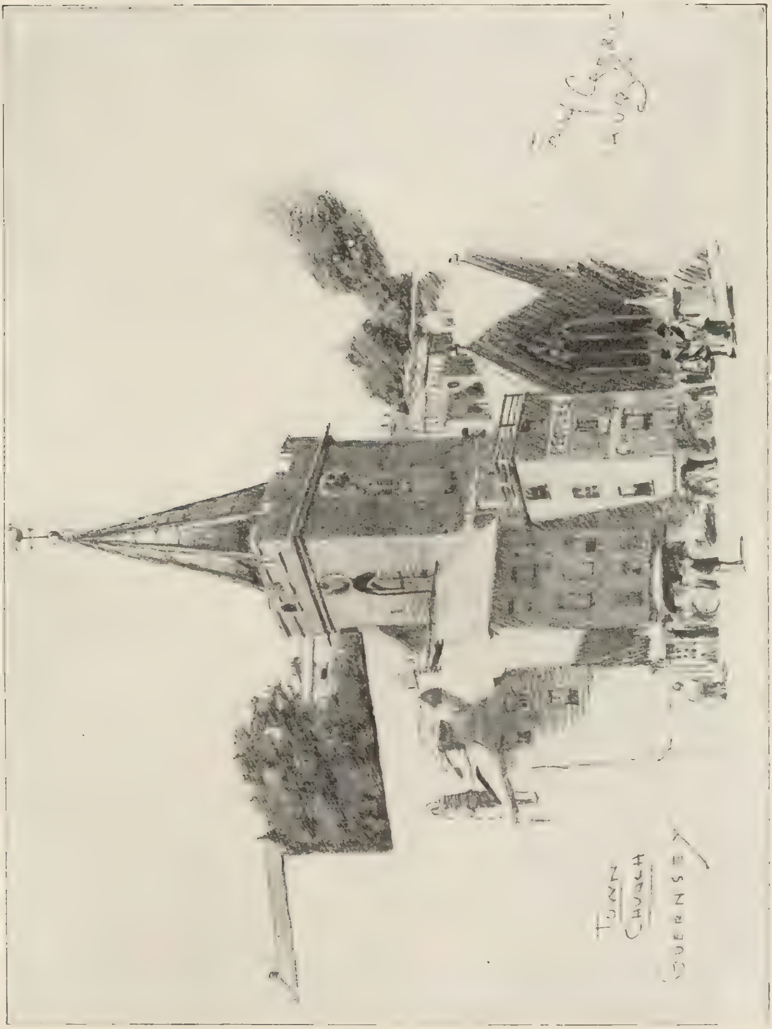
Rising early, we stumble up on deck in the grey of the morning and find ourselves enveloped with an opalescent haze. To the right we see a long grey shape emerging from the mist. Then as the boat approaches, the northern end of the island comes into view, a patchwork quilt of farmland with a sprinkling of white, red-roofed cottages. Next we glide by a rugged shore-line of brown rocks with their spots of blue shadow; a fishing village, scrambling up the cliff from a little cove; a two-masted schooner heading for the North Channel fishing grounds, which waits to pass our stern. Then, square and ancient, solid on its sea-seasoned rock, blazing in a morning sun, rises the substantial contour of Castle Cornet.

This time-worn stronghold has now fallen from its high estate as the residence of the governor of the Island, and is used as a garrison for British soldiers.

To the right of the castle is our stopping place, St. Peter-port, in a terrace-like formation beginning at eye-level with the old wholesale warehouses, next the steep-roofed dwellings one above the other, and surmounting these the Council Hall, and the Gothic tower of St. Elizabeth's College for Boys—a wonderful mass of good material for the artist abounding on every hand.

After landing, a lively procession of small-wheeled open carriages take the entire company of passengers into town. Alongside run rosy-cheeked girls to tempt us with huge clusters of grapes suspended in long-handled nets. There is fruit everywhere, delicious and brilliantly colored.

We soon reach the hotel. From the dock in front the castle looks especially interesting, so we lose no time before making a sketch of it. Incidentally we gain the acquaintance of Master Thomas Morgan, of


Town
Church
Guernsey

plain looks and gentle manner. We at once invent a fine future for Tommy and regret that the presidency of the United States is in his case inaccessible. It happens, however, that he has other ambitions. His father possesses a fishing boat in which Tommy has taken several trips; consequently, to become a first-class seaman in the King's Navy completely fills this boy's mind. So we try to content ourselves with the thought that some day he will be an admiral.

It is only necessary to turn about to get in range of the bold tower and spire of the town church. This bit is typical in its grouping, the picturesque buildings snuggling together, and leaning on one another like old cronies.

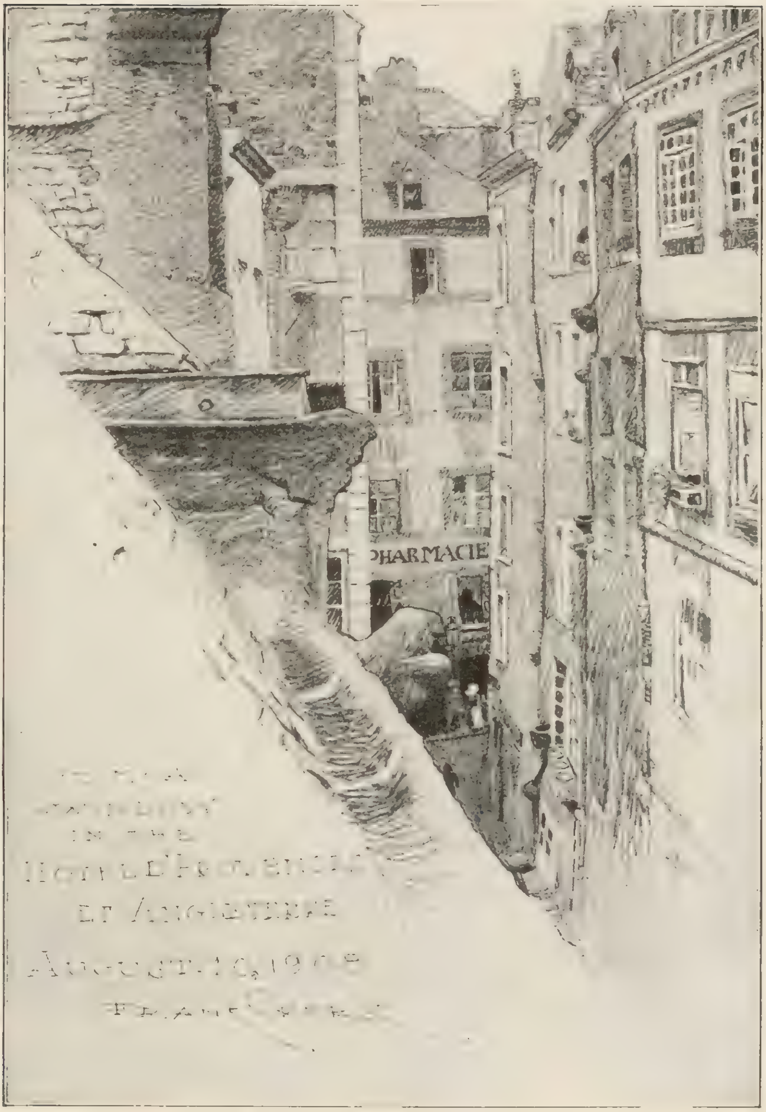
With a feeling of regret mixed with anticipation we board the steamer bound for St. Malo. Then there was a picture; in the background a solid mass of town buildings, and in the middle distance orange sails patched with white, painted boats—a thicket of masts and rigging—a mingling of French and English flags fairly dance upon the water and make a last delightful memory as we lean against the rail and bid farewell to St. Peter-port and the island of Guernsey.

When a few miles off the coast of France the sun goes behind a cloud, the wind freshens from the north, we pass a few uninhabited islands, and sea gulls multiply as a long ribbon of land is sighted ahead.

At our approach a dull outline becomes a promontory of rock upon which rests a delapidated pile of masonry marking the ruins of a once well-fortified outpost, where men fought bravely in the days when this port was a corsair stronghold. Then beyond, grey and moss-grown, spreads the ancient town of St. Malo, with its mediaeval ramparts, gates and pinnacled towers, old weather-beaten buildings with their quaint chimneys and chimney-pots closely clustered about the beautiful spire of St. Malo Cathedral. This town has been the home of many famous men, chief of whom is Jacques Cartier, who discovered Canada. There is an inscription to him on a tablet, within the altar rails of the cathedral, marking the spot where he knelt to receive the divine blessing before starting on the voyage which resulted in the discovery of Canada, May 16, 1535.

From our place at luncheon, an excellent subject presents itself, for the whole spectacle of a French market with its customs that have survived centuries is before our eyes. Women in booths with attractive headgears of white linen are engaged in the solemn business of selling fish. Black-gowned priests with expansive low-crowned hats, idle soldiers in gaudy uniforms of red and blue, sisters of charity, innkeepers,

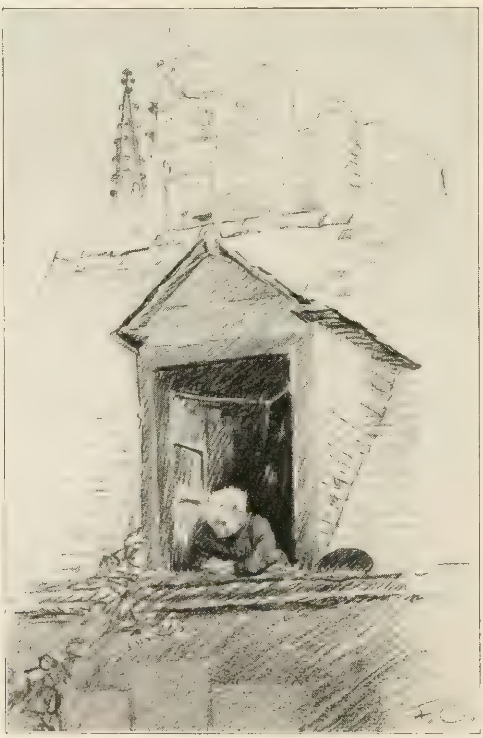

MARKET PLACE
ST. MALO


PHARMACIE

serious and gay housewives in clattering sabots, with bulky packages and huge baskets, dicker, chat, and move about. It is a busy place.

From a high window in the hotel we discover a fine problem for the pencil. It consists of a lofty mass of seventeenth-century houses with their roofs and dormer windows, with crumbling slate clinging to their sides, and far below a glimpse of gloomy shop windows and the narrow street. Beneath our window runs an old granite eve-trough curiously decorated; just opposite, the geraniums in a window box make a striking bit of color.

Outside the ramparts on the beach there is a different atmosphere. The greyness and grimness of the mediaeval town are left behind. There is sunshine and blue sky. The townspeople work and gossip; native tourists stroll about; and blue-gowned nurses play with well-dressed children amid rows of white and red striped bath houses and fluttering French flags sticking in the sand. In the midst of this life and movement rise the steep and sombre walls of the old outpost, making a sharp contrast with this picture of a modern summer resort.



SOME PHASES OF HOUSEHOLD ARTS IN THE SECONDARY SCHOOLS.

HELEN KINNE, Teachers College, New York.

THE recent rapid development of the household arts in the secondary field is bringing into prominence vital questions connected with this subject. It may now be considered as established in the secondary school curriculum, but, like the other subjects in the curriculum, it is in need of criticism and adjustment. In the vocational high school which does not prepare primarily for college entrance, the question of the selection of topics, their organization and their relation to the other subjects is a less difficult matter than in the college preparatory school. In this latter school the pressure brought to bear by the colleges makes it almost impossible to introduce household arts at all or, if introduced, to give the subject proper development. It would seem imperative therefore that some topic or topics included in the field of household arts should be so treated that it may count for college entrance. Already some effort has been put forth in this direction. A committee of the Teaching Section of the Lake Placid Conference of Home Economics has been working on this question for two years, but as yet has only reported progress in investigation.[1] This committee has been discharged in the development of the Lake Placid Conference into the American Home Economics Association. The former members of this committee are still at work and will report later in the American Home Economics Magazine. A point was gained last year through the committee on manual training in secondary schools of the North Central Association of Colleges and Secondary Schools. This committee after studying schemes sent in by request proposed the following subjects and points:

[1] A preliminary report is printed in the Proceedings of the Tenth Annual Conference of the Lake Placid Conference of Home Economics. Apply to B. R. Andrews, 525 West 120th St., New York City.

HOUSEHOLD ARTS AND SCIENCE (4 UNITS).

1. PLAIN SEWING (1 UNIT).

Every exercise in sewing should illustrate an important principle or process, or a simple combination of such principles and processes. Hand sewing and sewing machine work must be equally insisted upon.

a. The various stitches and their special uses.

b. Hand sewing; fundamental processes.

c. The use and care of sewing machines and their attachments.

d. The nature and special uses of cotton, linen and woolen goods.

e. The use of patterns; cutting out.

f. Taking measurements; making of simple garments.

2. SEWING AND MILLINERY (1 UNIT.)

a. Making of shirt waists, wash-dresses, and similar garments.

b. Millinery: Study of materials for hats; making, altering, and covering hat frames. The planning, making and trimming of seasonable hats of appropriate materials.

Throughout the course economy and good taste in dress.

COOKING (2 UNITS).

1. Food classified and tested for food principles.

A study of the effect of heat upon foods alone and in combination: experiments with leavening agents, and their uses shown in actual cooking. Bread making. The theory and practice of canning and preserving fruits, vegetables, and meats. Planning, cooking, and serving meals. Waiting on table.

2. The cost of food; market prices; the cost of meals. Household accounts. The family dietary. The planning, weighing, and cooking of apportioned meals. Diets for infants, invalids, and convalescents.

Sanitation: Selection of site, house planning; heating, lighting, and ventilating; water supply; disposal of waste; furnishing and decorating; cleaning processes, including laundry work.

While the association has adopted the syllabus submitted by the committee, it is still an open question as to whether or no the western colleges are ready to accept the subject as thus stated. This naming of the subjects as cooking, sewing, etc., places them in the manual training group. Most teachers of the household arts object to this inclusion; and it is probable that many of the colleges will not see in the subject

thus named and classified matter of sufficient weight to count as college entrance. How then must these terms be interpreted in order to show that here there is a subject on a par with those ordinarily accepted as a college requirement?

We have first to show that the subject has a thought content; and then that its practical activities make as exacting demands upon the pupils as those connected with experimentation in chemistry and physics on the one hand or in the wood working subjects on the other. What is the thought content? The subject is sometimes treated as if it were merely applied chemistry, physics or biology. Certain courses are planned with this thought so in view that the readers of the syllabi would say at once, "this is no new subject or differentiated subject, but merely an applied form of chemistry or physiology or the two combined." If this is our ideal why then burden the curriculum with another subject? This type form of a course in household arts and sciences is doubtless proposed to the end that if it appears as science its dignity will be at once recognized; but is this truly so? Should not teachers of the household arts and sciences frankly claim that their subject has a field of its own, and let it stand or fall on its own merits? This field of study is in fact the home and its environment. The purpose of the study is to develop the principles and practices that underly the proper conduct of the home. Its ultimate aim is to raise the standard of home life, and to promote the efficiency of the individual so far as that depends upon the home.

Here surely there is a subject of ethical and economic import, which does not need to lean upon other subjects for support. The household arts are no more and no less applied science than applied economics and ethics and fine arts. These all contribute their quota without making the subject any the less clearly defined. And this interrelation of subjects is already accepted elsewhere, as in the natural sciences, for instance. Physics is physics in spite of the fact that it draws so largely upon mathematics. Every teacher of chemistry would like to have his pupils grounded first in physics, and the teacher of physiology and biology uses both physics and chemistry. So here the sciences and art offer their contributions, but do not cover the whole field.

What are the definite topics in this study of the home? The main divisions are easily determined; that is, food, clothing, shelter and household management, the latter including questions of the budget and cost of living, problems of household labor, care of children and the social

side of home life. That these topics must contain a rich thought content would seem to be evident. Take for instance the question of food. How food is obtained and transported is an industrial study, and puts before the pupil some of the most difficult and important problems of the day. What good food is, what it contributes to the body, what is essential in its preparation may be touched upon in physiology and chemistry, but not completely. The question of the balanced dietary and its working out in practical daily menus involves ideas so difficult as to be almost beyond the grasp of the high school pupil unless handled with great skill. If to these is added the study of the cost of food, the conditions that determine this cost, and again the relation of food prices to wages and nutrition, we have no mean study in economics. Indeed it would seem an absurdity to deny the dignity and weight of the food problem as a subject for study, in view of its social significance and the imperfectness of our knowledge. The other topics, clothing, shelter, household management, each in its way has a rich and varied content.

In the second place the practical activities of the household arts demand skill in manipulation and exactness in experimentation not exceeded by the hand work in any of the other subjects. Take for instance the making of bread. We may have here a series of experiments difficult to carry out, and that amount to nothing without extremely careful work. By this is not meant such experiments as might be performed with yeast in the biological laboratory, but experiments with yeast in the bread dough itself, where varying amounts of yeast are used, with different temperatures and varying lengths of time. The effect of slightly changed conditions upon the texture, appearance and flavor of the bread can only be discovered by exact and patient work; yet such work as this can be done in the high school, and when done it should be recognized as difficult and weighty. Again on the practical side, we are prone to forget that the preparation of a meal involves problems not easy to bring to an easy solution. If our college authorities could accept the point of view of the high school pupils, they might see more in this subject than appears on the surface. A high school girl paused in the midst of her meal-getting where she felt herself not quite mistress of the situation to say, "What splendid training this is for a girl. It is better than mathematics." In such a subject then as food, there is certainly thought content and exacting practical work.

Taking all these topics together there is certainly an embarrassment of riches when we attempt to select that which is best capable of devel-

opment for college entrance. It is doubtless better to take one topic, say food, or clothing, and develop it intensively, rather than to attempt to crowd into a short space of time all the possible topics. But even in this one topic a teacher of the household arts knows full well that it would be difficult to develop all the aspects suggested above, even in two years. It is necessary to select one or two as the main topics, letting the others be subsidiary; as for instance, food composition and nutritive values, and principles of preparation for the large topics; menus, the cost of food, and purchasing food for the secondary topics, interwoven with the others. An excellent interpretation of the content is to be found in the syllabus prepared by the University of Illinois for the secondary schools of that state.

The question as to where the subject, say for instance, foods, should be placed in the four years, depends upon the general make-up of the curriculum of the school in question. To develop its full strength the subject is better either parallel with, or following the chemistry, physics and physiology; but as some one has shrewdly remarked, each high school teacher wants his own special subject in the fourth year. And it must be remembered that in the first, or in the first and second year of the high school the pupil's interest in the subject is to be gained. It would seem desirable therefore in the first year to have what may be called a survey course. The purpose of such a course is to offer an incentive to the pupils by giving work that appeals to them, and it also serves to open up the whole field. A most interesting and useful course of this nature is given in the freshman year of the Domestic Science course at the University of Missouri. A modified form of this course would certainly serve a useful purpose in the freshman year of the high school. Such a course would probably not be accepted for college entrance, but it would lead the way to an intensive course to follow later. The minor topics and the exact sequence of lessons must depend upon local conditions. The treatment must be somewhat different in those localities where the work runs through both the upper elementary and the high school, from that where it is found in the secondary school alone. This must always be true in the vocational school, especially where training for a trade is a consideration. Each state or city must plan its syllabus to suit local needs.

In the college preparatory, however, teachers of the household arts should unite in developing the content of a course both in food and clothing that will receive recognition from a number of our colleges. Girls

who are training in western high schools often attend eastern colleges, and the question of a college entrance course in the household arts is not to be determined by local conditions. Surely the content of the subject is rich enough to meet all requirements, if teachers will agree upon some definite interpretation.

Is not the weakness of this subject as a college requirement partly due to the fact that teachers of the household arts have not been clear in their definition of the subject and not fearless in claiming it as a subject in itself?

MADE BY STUDENTS IN STATE NORMAL UNIVERSITY, NORMAL, ILL.

THE INFLUENCE OF THE TEACHER ON THE CHILD'S INTERESTS.

E. Athelstan Ross.

MUCH time has been devoted by numerous investigators to studying the relation of the teacher to the child's interests, and much has been written within this field; still, many mistakes are at present made in the planning of courses and in the teaching of manual training, due, sometimes to a lack of knowlege, but more often to a misinterpretation or a misapplication of the essential underlying principles. It is the purpose of this article to speak briefly of a few of the principles involved and of their practical application to school work.

Professor John Dewey says:[1]

> Every interest grows out of some instinct or some habit that in turn is finally based upon an original instinct. It does not follow that all instincts are of equal value, or that we do not inherit many instincts which need transformation rather than satisfaction, in order to be useful in life. But the instincts which find their conscious outlet and expression in occupation are bound to be an exceedingly fundamental and permanent type.

Instinctive interests are an important part of the inherited equipment of every normal child. Some which may be made of great value in educational work are the interests in one's personal welfare, in living animals, in acquiring skill, in tools, machines, and all moving things, in things new or novel, and in the persons with whom one associates.

Two incidents may serve to illustrate the strength and value of children's interests: Each of the thirty benches in one of the summer schools in an important city on the great lakes was occupied by an ambitious boy who had through the year, by faithful work in his manual training classes, earned his right to make a model yacht to sail in the races at the end of the summer, or if he preferred, which was seldom the case, to make some other project. The instructor's attention was fully occupied and he did not see at the side of the room a boy about twelve years old whom some accident had deprived of one of his feet so that he had to use a crutch. Finally the boy went to the instructor and with a wistful, appealing look asked if he too might make a boat. The instructor soon learned that the boy was not eligible to be in the class—in fact, that he had never had a lesson in benchwork; so he told the boy he

[1] The Elementary School Record, Vol. I, No. 3.

was sorry, but that it could not be arranged. Then the little fellow asked if he might be permitted to help a smaller friend, the youngest boy in the class, in the making of his boat. The request was granted. The two boys worked together until it was evident that the smaller boy needed no more help; then the cripple asked if he might have a certain stick of wood with which to make something that he was very desirous of constructing. He said he felt sure he could make it properly without help from anyone. He worked faithfully and thoughtfully for many days and produced a crutch just suited to his needs, a piece good in design, workmanship and finish. Then he made a second and a third, until the instructor wondered if he meant to sell them, so he asked why he was making so many. With an earnest look the boy replied in a low, sweet voice, "For when I get big;" and there they were, three crutches in three different lengths.

In a government industrial and manual training school in Porto Rico the boys were busy at their benches. A quarter of a mile away the ocean waves were falling lazily against the rocks along the shore. A soft wind rustled the fronds of the tall cocoanut palms that grew along the streets, and gently swung the big green fans of the banana trees in the patio of the school. People walked leisurely by on both sides of the school, conversing, calling to one another, singing in the soft, musical Spanish language. Without, everything was peaceful, harmonious; and so within, for the boys worked always quietly, unremittingly, and never with feverish haste. A harshly discordant note was struck by the instructor's turning toward a certain boy and saying, "Jesus, you are the laziest boy in this class!" The boy evidently was deeply wounded. The conscience-stricken instructor kept him for a little friendly chat after school, and learned that the boy's mother had died six months before, and that was why the boy with the beautiful name had, in half a year, accomplished not one creditable piece of work. It was decided that he should make a cross for his mother's grave. After that no other boy in the class worked so faithfully, so religiously. His deep, sensitive, passionate nature, which had so nearly accomplished his downfall, was now helping him. The present purpose gave the tools new significance and sanctified the wood and steel and iron, and as the boy's interests were gradually transferred to the living world about him, he became an excellent student, and a young man worthy of a mother's pride.

The principle of acquired interests is thus aptly stated by Professor Adams in his *Herbartian Psychology*:

By deliberately concentrating our attention upon a certain class of subjects, we may build up such a powerful apperception mass that any fact connected with that mass will at once attract our attention quite irrespective of our will. This produces an alertness to certain classes of facts that may be of the utmost service in our experience, and therefore may be legitimately held up as one of the aims of education.

A certain boy had the reputation of being the most careless pupil in the school which he attended. He absented himself from his classes as often and for as long periods as he could, both with and without permission, so that as a result he was seldom promoted. His entire boyhood was spent where he never saw the broad expanse of lake or ocean, but he was interested in boats. He started to build in the manual training room a small model sailboat that should as nearly as possible follow the lines of a certain racing yacht. His absences from school at once ceased. The shaping, smoothing and hollowing of the hull; the moulding of the lead for the keel; the making of the sails and other parts of the rigging; the construction and attachment of the rudder; the varnishing of the masts and spars, staining of the deck, and painting of the hull all called for thoughtful, painstaking manual execution. The necessary computations for the various curves of the hull, angles for placing masts and spars, the weight of lead for the keel, the sizes and shapes of sails added zest and interest to his classroom work in arithmetic. His interest reached out to all kinds of boats, for he could understand them better now, with the result that certain parts of his geography claimed his willing attention. Some of the materials he had to order himself, so he acquired the ability to write simple business letters. His resourceful grade teacher was quick to give him a chance to build on what interested him so intensely, and thus she enlisted the boy's best efforts in his language work. As the boat neared completion the boy sometimes asked permission to take it home nights, saying on one of these occasions, rather apologetically, "It seems as if I can't keep away from it." He was promoted at the end of the year.

In his "Principles of Teaching," Professor Thorndike says:

Education should at times stimulate and favor inborn tendencies, at times inhibit them, and most frequently of all, direct and guide them. . . . Good teaching decides what is to be learned not by an appeal to interest, but to the general aim of education. Having so decided, it secures interest—the most, the best and the steadiest possible. Other things being equal, it uses instinctive rather than artificial interests, and common rather than rare interests.

It is not the function of the teacher to allow each child to pursue

his every passing whim or fancy; but rather to guide the child's attention and efforts along lines of such instinctive interests as shall be helpful, while at the same time developing desirable acquired interests. It is self-evident that the value of the kindergarten is due to its carefully chosen and well directed work. By this means desirable ends are attained far more quickly and surely than would be the case were the children left to themselves. The same principle applies to all departments of school work. The efficient teacher besides being a good technician must know what are the general aims of education, as well as the proximate aims of his own specialty. He must understand the natural instincts of children, and know how to use them in the development of desirable habits. He must know how interests are dependent on instincts and habits, and especially must he be able to select and foster those interests which best promote the aims of education, while he discourages and eliminates so far as may be the interests which are useless and harmful. He must know what expression is worth while, and how to make the conditions favorable to that expression, avoiding as far as possible everything trivial or worthless. This can be accomplished only by utilizing such stimuli as shall direct the child's interests along desirable channels.

The fact that a child strongly expresses a desire to undertake a certain project is no proof whatever that his interest in working on that project will be any greater than it would be working on something else. Right here is where many teachers commit gross error, resulting in waste of materials and time. A pupil's views are narrow. He sees nothing in its true relation to other things. He often misjudges his own ability. He does not know within what fields his instinctive interests lie. He is unable to distinguish between interests the most ephemeral and those the most permanent. He does not know what will be helpful, or what will be useless or worse than useless. If he undertakes a project which he is incapable of accomplishing with a reasonable degree of success, he will soon lose interest, and will voluntarily abandon it. It is difficult to perceive wherein his desire to leave it is not worthy of as much consideration as was his expressed desire to begin it, as his unguided interest now leads elsewhere. On the other hand it is well known that if the project be too easy, interest will flag and waste will result.

One who is unable to take the place of the child's deficiencies above indicated, by helping him to choose the right work and fostering his interest in it, is not a teacher and has no right to pose as one.

SIMPLIFIED MECHANICAL PERSPECTIVE.[1]—III.

FRANK FORREST FREDERICK.

A CIRCLE may appear as a circle, a line or as an ellipse. It appears of its true shape when it is at right angles to the direction in which the spectator is looking, as a line when included in a plane that passes through the eye, and as an ellipse when the circle is in any other position in relation to the eye.

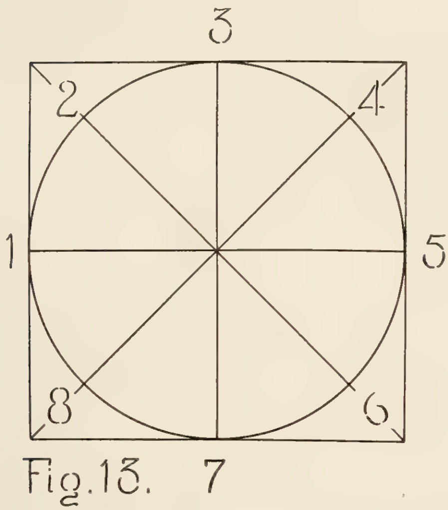


Fig. 13.

If a circle is inscribed within a square there are four points, 1, 3, 5 and 7, Fig. 13, where the circumference of the circle is tangent to the sides of the square, and four points, 2, 4, 6 and 8, where the circumference of the circle intersects the diagonals of the square.

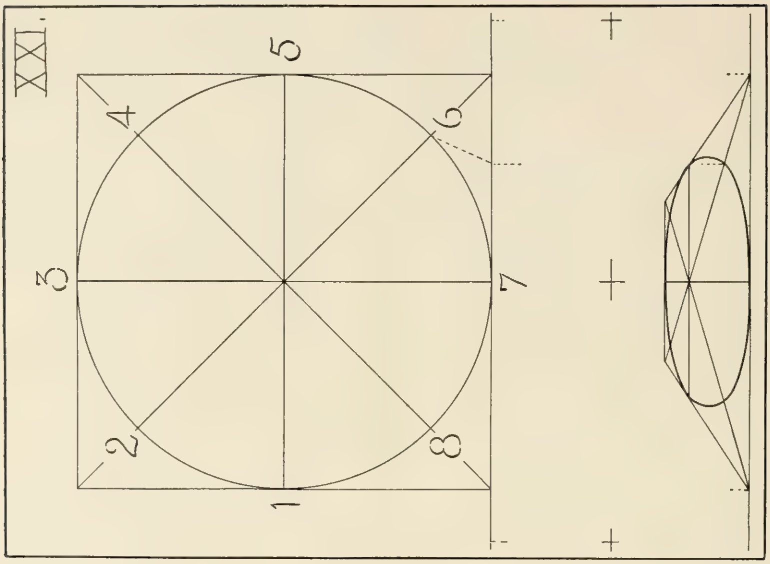
When a circle is put into perspective it is usual to draw a square about it, find the eight points just mentioned, put the square into perspective, and draw the ellipse (the perspective of the circle) through the perspective of these points.

PROBLEM XXI.[2]

Plate vertical. Scale 1″= 1′ 00″. S. P. 4′ 0″ to right and 3″ above. C. V. 3′ 9″ from S. P., P. L. at S. P., H. 2′ 0″ above P. L.

In this problem a circle, 6′ 0″ in diameter, is directly in front of the spectator. A square, with sides tangent to the circumference, is drawn

[2] *Note to Teachers*:—When students begin the study of the circle in perspective it is well to draw circles upon the floor, or upon the blackboard, as problems to be worked by the class. These should be drawn large (six or eight feet in diameter) and the students placed near them, otherwise their drawings will be too small to be worked accurately.


XXI.
1
2
3
4
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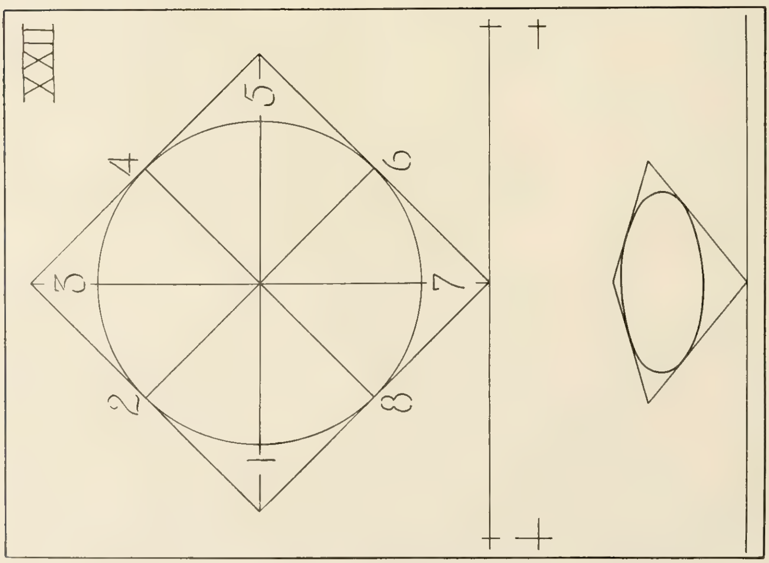
XXII
1
2
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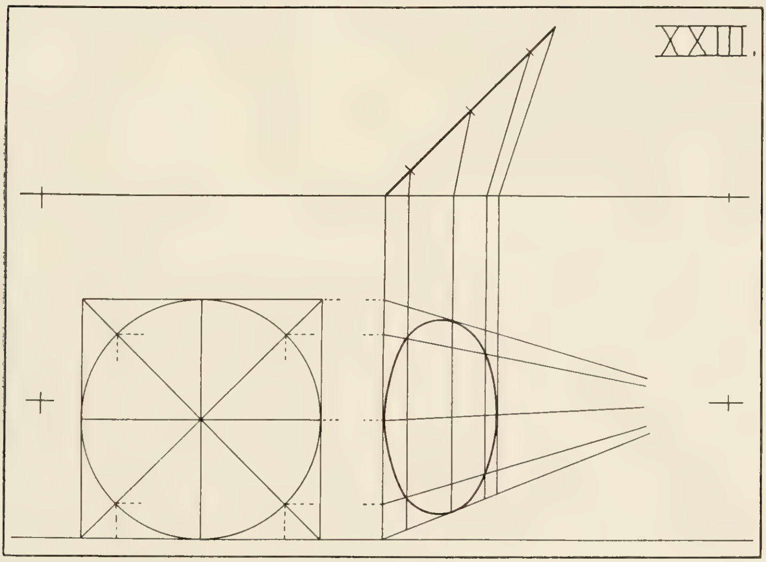
4
5
6
7
8

and points 1, 3, 5 and 7 found. By drawing the diagonals of the square points 2, 4, 6 and 8 are found. Putting the square into perspective according to the method explained in Problem IX, the perspective of the circle—the ellipse—may be drawn through the perspective of the eight points 1 to 8 inclusive.

Problem XXII.

Plate vertical. Scale ¼″=1′ 0″. S. P. 16′ 0″ to right and 1′ 0″ above. C. V. 15′ 0″ from S. P., P. L. at S. P., H. 12′ 0″ above P. L.



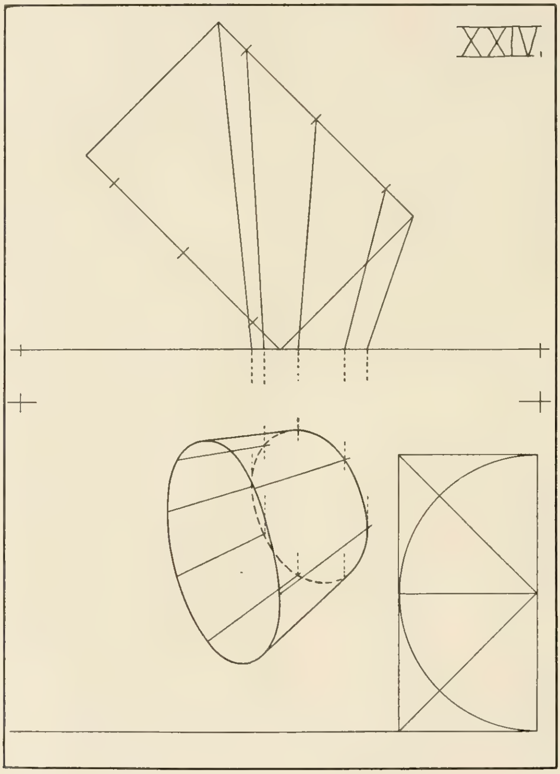
A square, 19′ 0″ x 19′ 0″ on the horizontal plane, has its sides vanishing to right and left at 45°. Within the square is a circle 19′ 0″ in diameter.

To find the perspective of the circle draw the perspective of the square with its diagonals and diameters, and find the perspective of the points 1 to 8. 2, 4, 6 and 8 are found at the ends of the diameters, 1 and 5, on the diagonal parallel to the picture plane, as points are usually located, and points 3 and 7, on the diagonal at right angles to the picture plane, according to problems IV and V.

Problem XXIII.

Plate horizontal. Scale ¼″ = 1′ 0″. S. P. 22′ 0″ to right and 1′ 0″ above. C. V. 20′ 0″ from S. P., P. L. at S. P., H. 8′ 0″ above P. L.

A vertical circle, 14′ 0″ in diameter, vanishes to the right at 45°.

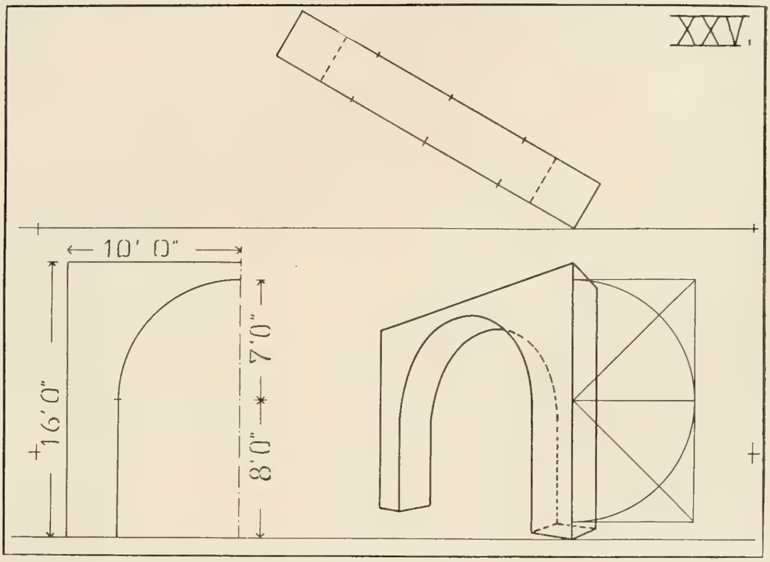


Problem XXIV.

Plate vertical. Scale ¼″ = 1′ 0″. S. P. 16′ 0″ to right and 7′ 0″ above. C. V. 15′ 0″ from S. P., P. L. 2′ 0″ from lower margin line, H. 19′ 0″ above P. L.

In this problem a circular plinth, base 16′ 0″ in diameter, altitude 11′ 0″, rests on its side in the horizontal plane which is 19′ 0″ below the level of the eye. The axis of the plinth vanishes to the right at 45°. A lowered picture line is used, to prevent confusion of lines, because

the distance from S. P. to C. V. is less than the diameter of the base of the plinth, and also because the distance from P. L. to H. is greater than the distance from S. P. to C. V. P. L. can be placed wherever convenient providing it is at a greater distance from Tr. V. Pl. than H. is from P. L.



Put the visible base into perspective (as in Problem XXIII). Find the eight points through which the ellipse representing the invisible base is to be drawn by carrying lines from the eight points already found on the visible base to V. P. R., and projecting to them, from the plan, the corresponding points on the invisible base. Only the working lines used to find the invisible base are lined-in.

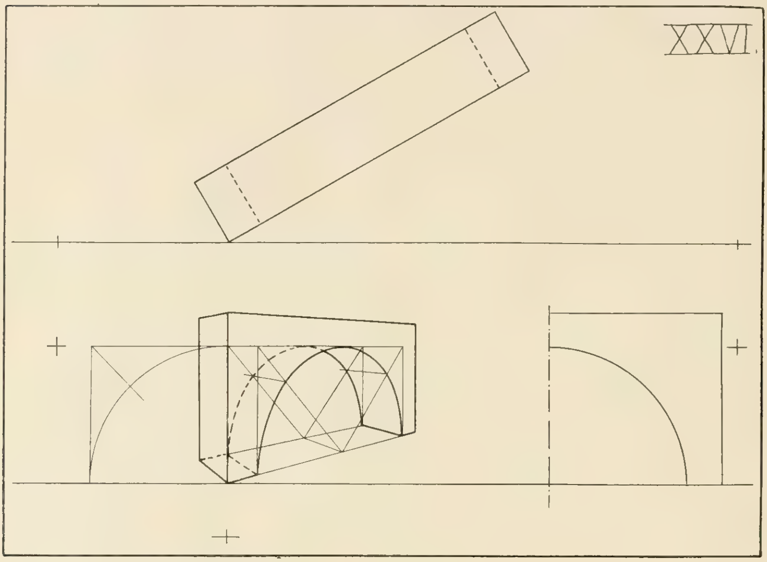
The entire ellipse, in both freehand and mechanical perspective, should *always be drawn* even if but a small part of its circumference is afterwards lined-in. In no other way can the true elliptical curve be obtained.

Problem XXV.

Scale ¼″ = 1′ 0″. S. P. 33′ 0″ to right and 1′ 0″ above. C. V. 18′ 0″ from S. P., P. L. at S. P., H. 5′ 0″ above S. P.

In this problem a plinth 16′ 0″ x 20′ 0″ and 3′ 0″ thick rests on one 3′ 0″ x 20′ 0″ face and vanishes to the left at 30°. A circular arch

is cut from this plinth as shown by the elevation. For convenience in working, a circle of the size of the arch is drawn upon the picture plane with its diameter coinciding with the nearest vertical edge of the plinth.



PROBLEM XXVI.

Scale ½″ = 1′ 0″. S. P. 6′ 3″ to right and 6″ above. C. V. 8′ 6″ from S. P., P. L. 1′ 6″ from S. P., H. 4′ 0″ above P. L.

From a plinth, vanishing to the right at 45°, base 5′0″ x 10′0″, altitude 2′ 0″, a semi-circular arch, with radius of 4′ 0″, is cut as shown by the elevation. From the drawing it will be seen that the diagonals of the enclosing square may be put into perspective and used as *tests* in the location of the eight points through which the ellipse is drawn.

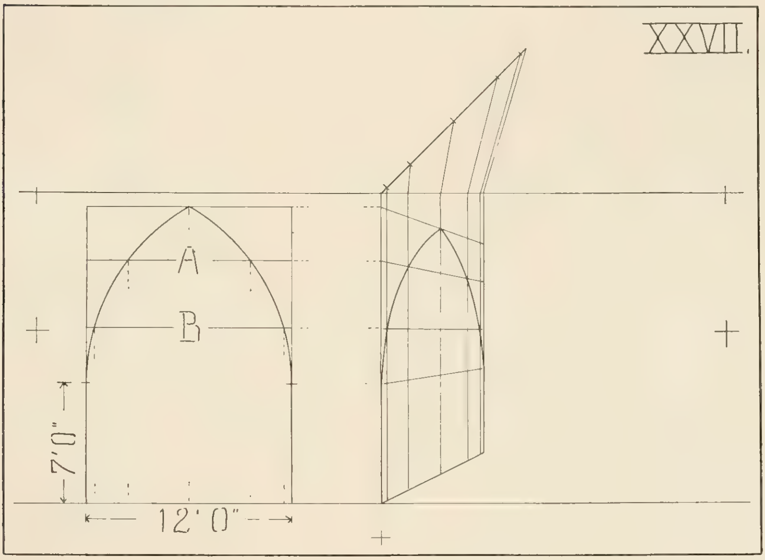
PROBLEM XXVII.

Scale ¼″ = 1′ 0″. S. P. 22′ 0″ to right and 1′ 0″ above. C. V. 20′ 0″ from S. P., P. L. 2′ 0″ above S. P., H. 10′ 0″ above P. L.

Any area may be put into perspective by enclosing it within a rectangle and locating points in its perimeter by means of known lines. In this problem a pointed-arch opening, as a door or window, is drawn. Lines A and B are placed at random.

Problem XXVIII.

It is hoped that students have noticed that while the short diameters of the ellipses drawn have coincided with a diameter or diagonal of the square used in finding the perspectives of the circles, the long diameters have not, but have in every case appeared to be nearer the spectator. In this problem the method of finding the long diameter of an ellipse repre-



senting a circle upon, or parallel to the horizontal plane, is explained.

In practice this diameter is located by guess as an ellipse is seldom drawn large enough to permit the exact location of the long diameter to be found.

Plate vertical. Scale $\frac{1}{4}'' = 1'\ 0''$. S. P. 16′ 0″ to right and 1′ 0″ above. C. V. 15′ 0″ from S. P., P. L. at S. P., H. 10′ 0″ above P. L.

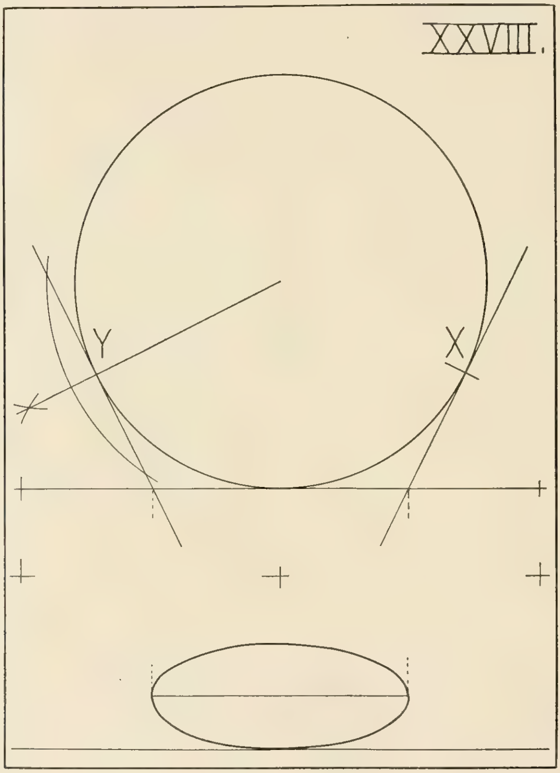
The circle is 24′ 0″ in diameter.

After the ellipse is found, as in Problem XXI, draw from S. P., to right and left, lines tangent to the circle. Find the exact points of tangency by drawing through the center of the circle lines at right angles to the tangent lines. Points X and Y will be found to be the tangent points. Put X and Y into perspective, according to Problem V, and the ends of the long diameter of the ellipse will be found.

Problem XXIX.

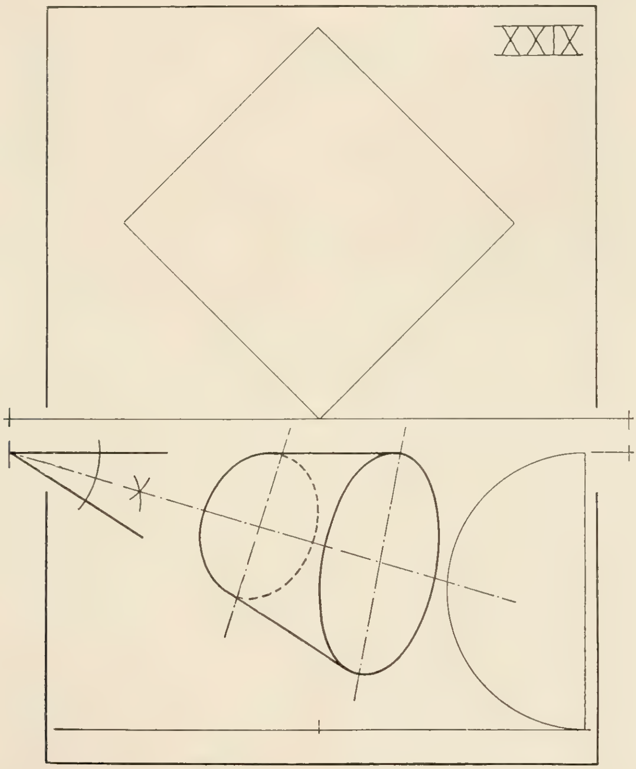
Plate vertical. Scale ½″ = 1′ 0″. S. P. 8′ 0″ to right and 1′ 0″ above. C. V. 9′ 0″ from S. P., P. L. at S. P., H. 8′ 0″ above P. L.

In this problem the perspective of a circular plinth (diameter 8′ 0″, altitude 8′ 0″) as seen by an eye 9′ 0″ distant and 8′ 0″ above the horizontal plane is found. Any object so large, seen from so near, will appear when put into perspective, as distorted or in "violent perspective," as Problem XXIV, but from this problem two facts relating to the appearance of cylindrical objects of great assistance in freehand drawing can be learned.



First: The short diameter of the farther ellipse is, compared with the long diameter, proportionately greater or longer than the short diameter of the nearer ellipse.

Second: The long diameters of the ellipses representing the bases are at right angles to the axis of the solid. This is but approximately true in this problem on account of its violent perspective, but is near enough to enable the student to realize that tests for the drawings of



cylindrical objects are lines drawn to represent the axes of the objects and lines at right angles to the axes to represent the long diameters of the ellipses.

If the point of intersection of the long diameter of an ellipse representing the circular base with the axis of an object should be taken as C. V. there would be no distortion and the right angle would appear as such.

Part IV will be devoted to the perspective of oblique lines.

INDUSTRIAL TRAINING IN THE GRADE WORKSHOP.

Charles F. Smith.

THE industrial educational movement which engages the attention of educators at the present time, forces itself upon the manual training worker. What can be done in the workshop toward the advancement of this movement? Can we help that vast number of boys who fail to finish the grammar grades and begin their lifework at unskilled labor? When they reach an age at which they would be accepted as apprentices in skilled trades, they have no ambition to begin at the bottom and work for less wages. How can we expect their attitude to be otherwise? For example, the boy leaves school and enters some large factory where he learns practically nothing of its organization, operation or products. His daily task is to perform one operation on a single piece that forms a part of a complicated machine. He has no idea of his worth to society, is unhappy and discontented because of his failure to realize his youthful ambition to be something more than an unskilled workman, whom he has been taught to consider an inferior person. He knows little about the industry in which he is engaged; he has had no opportunity to study the underlying principles of the machines he sees about him, and believes the study of them beyond him. By giving boys an insight into the most important local industries, and a knowledge of the fundamentals of machines and power, they would not be plunged headlong into a sea of vagueness, but enter into their work with ambition to rise above their single tasks. In this way we would be able to develop "industrial intelligence," which the Massachusetts Commission says "is a mental power to see beyond the task which occupies the hand for the moment, to the operations which have preceded and to those which will follow it . . . power to take in the whole process, knowledge of materials, ideas of cost, etc." When this intelligence is acquired, a boy will try to understand what is going on about him; he will take a more comprehensive view of his environment, and be of greater service to himself and to his country.

To get the most industrial benefit from shop-work, whatever is made should have an important place in a present-day industry. The center of interest should be the industry rather than the model. If a long time is spent in making a waterwheel, it may closely resemble the

real thing, and the boy may know much about it, but when finished, all he has is a waterwheel. The value of this would scarcely exceed that of any formal model, such as a chair or table. A machine taken up in this way is apt to be merely an isolated physics problem. If this same wheel furnishes power to run the machinery of a shop which represents a high grade industry, its use will be more easily understood, it will have more industrial significance and arouse a keener and more lasting interest. In every grade, the projects made and studied should be a part of some local industry, so that the boy may have a deeper interest and a better understanding of local conditions. Then, upon leaving school, he will have useful knowledge of the society of which he is to become a member.

Since the beginning of the XIXth century all our industries have been either created or transformed, and there is a steadily growing demand for specialized, complex, automatic machinery which necessitates subdivision of labor. With the rise of this factory organization, the number of journeymen is decreasing, while the need for trained and thoughtful men is increasing. The only function of the shop to-day is to produce its specialty; therefore a general knowledge of the fundamental principles of machines and power, which play a most important part in every industry, must be gained elsewhere. Modern machines may be studied in the school, but they are too complicated to be constructed accurately. Machines should be studied in simple progressive terms, bringing out the effect of improved machinery upon civilization. More primitive types may be built, involving the same fundamental principles as modern machines. Some questions to be considered in introducing industrial work with machines and power elements are: first, separation of boys and girls; second, special teachers; third, equipment and materials; fourth, projects.

Place for separation. The best place for separation would seem to be in the sixth grade. Here, at the age of eleven or twelve, the girl is ready to take up the study of domestic science and domestic art, and the boy needs more advanced work than the handicrafts. At this age the boy is interested in finding out for himself, and should have some real concrete problem to solve, involving judgment, reason and deliberation, and affording an outlet for his inventive and mechanical genius. He feels himself a real and capable worker, and is only satisfied with real things which provide abundant opportunity for individual achievement and self-expression. He is interested in what makes the machine go and not merely in the fact that it goes.

The teacher. The success of this work depends almost entirely upon the teacher. Besides the ordinary requirements for a teacher, a man should have some technical training that he may understand the mathematics and mechanics involved, and must be familiar with practical industrial conditions. Considerable executive ability is required to organize the class and group work, and the teacher must be willing to take time for the preparation and planning of lessons.

Equipment and materials. A well-equipped wood-working shop with a few extra hand tools for general use would be sufficient for this work. A drill-press and an engine lathe would be very valuable additions. For his own use, the instructor might need a power saw. In most of our workshops of to-day wood is the only material used, but in this work the boy comes in contact with a number of other important materials, and it is a question whether these materials would cost more than the wood required to make a set of formal models, for the progress made in this work is not as rapid as that in which the aim is the product and tool processes without industrial ideas.

Projects. Strictly individual models should be made in beginning an industrial project. In this first model the teacher should establish the desired standards, carefully note the work of each boy, and thereafter get him to raise his individual standard. Here is an excellent opportunity for each boy to build a machine. We may consider productive machines in their social relation and classify them under five heads, according as they are used for food, clothing, shelter, transportation and communication.

In rural districts, dairying and milling might be taken up as the study of industries. Primitive forms of machines used to make butter and flour could be made. Some other industries either directly or indirectly connected with food, which could be profitably studied are: sugar refining, the manufacture of pottery, stamped ware, scales, bags, boxes and baskets.

For subject matter in the study of clothing it would not be necessary to go beyond textile industries, but we could find opportunities in knitting, leather-working, carpet, brush, and shoe making. The building of a laundry would make a good group problem. Machines that might be made are a pump, washer, wringer, mangle, dryer, and finisher. If the domestic art and science classes took a part in this work they would get an insight into an occupation which is a part of housework.

Under shelter may be considered machines used in building construction and in the production of building materials. Among these

are the excavating machine, derrick, crane and elevator. Materials may be studied under separate heads, as iron and steel, lumber, brick and tile, paints, stone and glass. Under this head we may also place the electrical, heating and lighting apparatus.

The best opportunities under the head of communication seem to be in the construction of telegraph and telephone instruments, paper and book making, printing and photography.

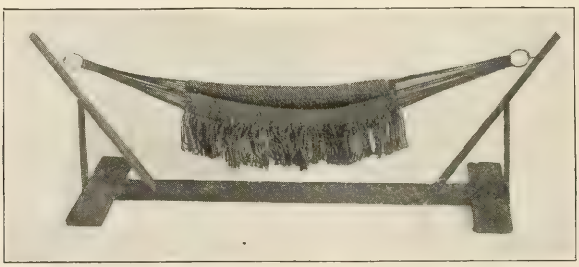
Under transportation the industries which might be studied are the manufacture of vehicles for transportation on land and sea, loading and unloading machinery, and bridge building. There are many important iudustries which cannot be directly included under the above classifications, such as machine tool construction, oil refining, mining, etc.

In connection with shopwork, shop visits made at opportune times are of great value. After the boy has an insight into his work, he will go into a shop, see machines and appliances similar to those he is making performing actual work, and ask surprisingly intelligent questions about them. As it is difficult to deal with a large group of boys in the shop, explicit instructions should be given regarding the obesrvations to be made. An excellent way to accomplish this is to give a list of questions to be written in note books, and to have the answers recorded at the time of observation in the factory, and after the visit have the boys write a paper from these notes. Another aid is a shop library, where the boys can refer to drawings, photographs, illustrated scientific magazines and catalogues for ideas and suggestions. Have the boys consult the shop library at any time that a question may arise. In connection with industrial talks and visits, a stereopticon is a great aid. In large cities, these talks could be arranged so that one stereopticon and one set of slides could be used by many schools.

The above methods of attacking industrial projects are carried out successfully in one of our best Eastern schools. In the sixth grade a foundry was made and equipped completely, so that castings could be made from iron melted in the cupola made by the class. The class decided that a waterwheel would be the most efficient and practicable source of power to run their blower, elevator and crane. After each boy made a flask, rammer and slicker and the building was finished by a group, each boy made a waterwheel and the best one was used to drive the machines which were made later by groups. After explanation of the purpose of the wheel and its use, present and past, work was commenced. Little time was spent in studying the machanics and physics involved, or in making drawings of a thing about which they

knew but little. The advantages of the over-shot, under-shot and jet wheels were considered, and the kind of stream required brought out the use of mill ponds, dams, and city water pressure. When deciding on the form of bucket, its evolution to the present form was illustrated by showing the action of water on different shaped buckets. Then, the bucket decided upon was made in four operations. Four boys worked in a group and each carried through one operation on four sets, illustrating the advantages of the division of labor, which were previously discussed by the entire class. When the waterwheels were completed, each boy performed a brake test on his own wheel and calculated its efficiency in horse-power.

To-day industrial work of this character is carried on in extremely few schools. Supervisors are not convinced that average school conditions will permit, but very few doubt its importance. This field must be worked up in this country, for we cannot go abroad for illustrations. Certain German cities are doing this kind of work, but we cannot compare our schools with schools in which the curricula are designed to meet entirely different social needs; we never know definitely even the approximate places our children will occupy in society. It does not seem improbable that the time is coming when the combined efforts of our leading educators, educational societies and manufacturers will bring about a revolution in our shopwork in the upper grades which will give the industrial arts a foremost position in the school curriculum. If this change does come, our education will conform to Butler's definition when he says, "life and education are identical."



MADE BY STUDENTS IN STATE NORMAL SCHOOL,
MANKATO, MINN.

RATING OF CONSTRUCTIVE WORK.

G. B. St. John.

PERHAPS constructive work, more than any other study in the school course adapts itself most readily to the application of a double standard of rating. These two standards naturally fall under the two divisions of "work efficiency," and "effort put forth."

Dr. Cattall states that "in examinations and grades we attempt to determine individual differences and to select individuals for special purposes. It seems strange that no scientific study of any consequence has been made to determine the validity of our methods; to standardize and improve them. It is quite possible that the assigning of grades to school children and college students as a kind of reward or punishment is useless or worse; its value could and should be determined."

All school subjects do not adapt themselves equally well to examination; literature and psychology are much more difficult to grade than mathematics.

For constructive work, however, there is a clear, well defined standard of excellence set by the industrial world and the constructive work of pupils should be compared with this accepted standard and marked accordingly. However, when this grading by comparison alone is used, a most important factor in the value of the marking system is lost sight of, viz: a recognition of the effort put forth on the part of the pupil.

As Professor Thorndike says, "There are two kinds of pupils, those able to work with ideas, and those able to work with things." If the object of construction work in our schools is to teach the pupil to fit himself to the social and industrial life in which he finds himself, much of this educational worth of manual training would be lost if the work were graded by the outside standards alone.

In a pure trade school, such as the Baron de Hirsch Trade School for Boys, which offers a highly specialized course of five months, this system might be applied. Boys attend this school to learn certain trades, not to receive a general education. If their work falls below the market standards, it should be marked inefficient and no credit for effort given, as the school aims to make conditions within the school as near as possible like those to be found on the outside. When a boy leaves a

trade school of this kind to take a position, his work is compared with the standard work and the boy meets at once the problems of returns for actual work accomplished.

On the other hand, in our public schools, more than mere skill and knowledge is aimed at through our industrial work, and the pupils should be allowed to know not only how their work compares with accepted standards, but the credit allowed them for effort put forth.

Many systems are in use in different schools and the manual training teacher is often obliged to conform to the grading system used in marking other subjects, whether it be on the percentage basis or on the basis of A, B, C, D, etc. Under the latter system the manual training teacher gives a boy B or C, as the case may be, having himself considered in his own mind both the quality of the work done and the effort on the part of the boy. To another boy he gives the same grade whose work at once shows itself to be superior to the work of the first boy, but in the mind of the teacher, the effort on the boy's part did not equal the actual work performed and he balanced in his mind these two considerations. Value, educationally, is lost in this way and stimulus on the part of the boy is not encouraged when he sees two finished pieces of work so different in quality given the same rating, and he fails to have pointed out to him the fact that, in all work, effort has great value and, through proper recognition of this effort, greater effort will be put forth in the future.

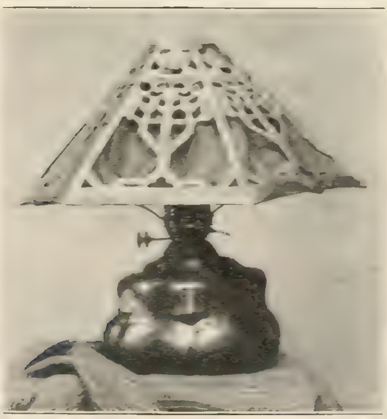
In one system of schools this combination has been worked out with great success. The grades A, B, C, etc., are used as follows: E—excellent; G—good; M—medium; L—low; F—failed. The work is marked under these two headings: Work and Effort, the work being marked as work and the effort according to the real effort shown on the part of the pupil. No average is struck but the two marks remain as two separate grades. If, on the other hand, the pure per cent system were used an exact average could easily be struck and the pupil be allowed to see exactly where he stood in regard to both work and effort and improvement.

Some considerable discussion has been made upon the worth of written examinations in constructive work. Many hold that it would be advisable to ascertain in concrete terms, the ideas gained by the pupil in his industrial work but, while this is no doubt, an excellent way in determining the exact knowledge of the pupil, yet, the pupil who is able to work with ideas might secure a much higher grade than the pupil who

was able to work with things, though, when he came to the actual doing, his powers would be far below those of the other pupil. There can be little doubt, however, that these written examinations would be of great value in serving to bring together the ideas of pupils, and while the work of the pupils able to work with ideas would be tested farther at the bench, the ideas of the pupils able to work with things should be tested in the written examinations, for as Dr. Wier Mitchell says, "the working hand makes strong the working brain."

In speaking of the marking system Dr. Henry Drisler says that the principal object of marking college students is to grade them for assignment of honors, which may be of two kinds: 1st, honors of laudation, such as places at commencement or in the annual catalogue; and 2nd, pecuniary honors, such as fellowships, scholarships and prizes.

In either case, the design is, or should be, to arrange classes in order of merit, not to indicate the absolute merit of individual students.



OUTLINE OF A ONE-YEAR COURSE IN MECHANICAL DRAWING FOR HIGH SCHOOLS.

Edited by WILLIAM T. BAWDEN.

THE following outline of a one-year course in mechanical drawing is presented as the third in a series contained in the report of the Committee on Manual Arts at the Fourth Annual High School Conference, held at the University of Illinois, Urbana, November 23, 1907.[1] The outline of the course in woodworking was a revision and more detailed statement of that adopted by the standing committee on course of study for the common schools of the County Superintendents' Section of the Illinois State Teachers' Association. A copy of this outline was published in the MANUAL TRAINING MAGAZINE, Vol. IX., December, 1907, p. 158. A copy of the outline of a high school course in metal working was published, Vol. IX, April, 1908, p. 335.

Following is the outline of the course in mechanical drawing, intended to occupy 180 hours:

I. Subject matter: Straight lines, measurements, use of tee-square and triangles, ruling pen, conventional lines, freehand working sketches.

Problems: Rectangular frame, triangular frame, try-square, bracket, box, bench, hook, etc.

Geometry: Straight line determined by two points, or by one point and direction; division of right angle into halves and thirds.

Relate to Drafting and Woodworking: Practical methods of drawing straight lines and angles of 90°, 60°, 30°, 45°.

II. Subject matter: Circles, use of compass, center lines, cross-hatching sections.

Problems: Ring, circular picture frame, flower pot, cylinder head, circular box, etc.

Relate to Geometry and Woodturning.

III. Subject matter: Tangents, finding centers and points of tangency.

Problems: Torus, gland, crank, face-plate, bearing, link.

[1] For report of this Conference see MANUAL TRAINING MAGAZINE, Vol. IX, February, 1908, p. 254.

Geometry: A tangent to a circle is perpendicular to a radius at the point of tangency.

Relate to manufacture of engines and machinery.

IV. Subject matter: Planes of projection, projecting to horizontal and vertical planes, revolution of planes, construction of geometric figures.

Problems: Rectangular prism, octagonal prism, hexagonal prism, pentagonal prism, triangular prism, pyramids with similar polygonal bases.

Geometry: Construction of hexagon, octagon, pentagon, etc. Descriptive geometry: Revolution of planes and points.

Relate to drafting: Practical methods of constructing octagon and hexagon, having given a side or the diagonal and the diameter.

V. Subject matter: Revolution of solids. (a) Two views of object with sides parallel to planes of projection; (b) Same, with object tipped to given angle with the horizontal plane; (c) Same, with object tipped to given angle with the vertical plane; (d) Same, with object tipped to given angles with both planes.

Problems: Cube, angle block, polygonal prisms and pryamids, irregular rectilinear objects.

Relate to descriptive geometry and architectural and engineering drafting.

VI. Subject matter: Developments. (a) Prism, (b) Pyramid, (c) Cylinder, (d) Cone.

Problems: Prism cut by a plane; similarly, pyramid, cylinder, cone, etc.; funnel, pan, etc.

Relate to analytic geometry, plotting curves, construction of ellipse. Relate to tinsmithing, etc.

VII. Subject matter; Intersections. (a) Centers in the same plane; (b) Centers in different planes.

Problems: Cylinder cut by prism, two cylinders of different diameters, sphere cut by prism, etc.

Relate to analytic geometry; tinsmithing, etc.

VIII. Subject matter: Lettering. Emphasis on (a) Placing, (b) Form, (c) Slant, (d) Spacing, (e) Stroke.

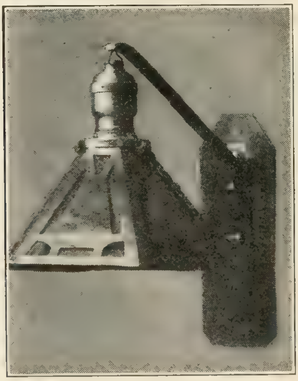
Problems: Gothic alphabet and figures, texts in freehand, hairline Gothic, stump writing, etc.

Relate to design, study of composition, drafting.

IX. Subject matter: Working drawings. Furniture.
Problems: Towel-roller, table, stool, screen, cabinet.
Relate to woodworking, furniture designing and manufacturing, etc.

X. Subject matter: Working drawings. Machine parts.
Problems: Wrench, pulley, coupling, pillow block, etc.
Relate to machine tool work, manufacture, etc.

XI. Subject matter: Building plans, floor plans, elevations, perspectives.
Problems: Summer cottage, railway station, small suburban house, etc.
Relate to freehand drawing, architecture, building, etc.



EDITORIAL

Definitions Called for Concerning Industrial Education. At a meeting of the manual training section of an educational convention recently held in New Haven, Conn., after an address strongly favoring the extension of industrial and technical education, one of the audience, a manual training teacher of long and successful experience, requested the speaker to give, if he could, a clear definition of certain terms now much used by advocates of industrial education. It is hardly necessary to say that the terms referred to were "manual training," "technical education," "vocational training," "industrial education," "trades schools," and "continuation schools," for a similar question has been asked many times. The one to whom the question was addressed made an off-hand attempt at defining these terms and probably did help to remove some of the haziness which surrounded these terms in the minds not of one but of many teachers in the audience. The speaker admitted, of course, that no hard and fast definition of these terms is possible. Some are more general than others; but it is impossible, he thought, to conceive of any of them as having an absolutely defined content without some overlapping in meaning. Not one of these forms of training can be undertaken without involving to some extent all of the others. But it was pointed out that the characteristic thing about the various lines of work properly indicated by these terms is to be found by noting the chief aim or purpose of the line of work under consideration. Thus *manual training* is entirely general in its aims; and whatever may have been its first motive it is now generally understood to refer to what may be called the cultural effect of such constructive work as is given in manual training courses. It is primarily a training not of the hand but thru the hand. *Industrial education* is a much broader term—indeed almost as broad as education itself—for it includes all educational activity, whether of work or of study and of whatever grade, which bears a close relation to the industries. That part of industrial training which may be considered as parallel with manual training has been named elementary or preparatory industrial training; so that, as applied to public school systems, industrial schools are generally understood to be schools of the elementary or secondary grade having for their chief aim preparation for industrial pursuits. The term *technical education* has come to be applied to the more advanced

forms of industrial education illustrated in technical high schools and polytechnic schools of college grade. *Trades schools* are a more specific form of industrial schools having for their object the teaching of certain specific trades or so much of those trades as it is possible to teach in a school. The term *vocational school* ought to include the industrial school, the trades school—excepting those of a very general type—and also the commercial school, *i. e.,* those schools which include in their courses of instruction definite preparation for any vocation whatever. *Continuation schools,* more clearly defined abroad, are those schools which are carried on, generally in the evening, for the purpose of supplementing previous school training. Their chief aim is to give the employed classes an opportunity to receive training which shall be of direct benefit to them in their present or prospective employments.

Local Needs the Paramount Consideration

But we need not give ourselves much concern about the mere question of the name. The important thing is to realize the true nature of the problem to be met and to devise and put in operation some practical plan for meeting that problem. Very careful study is being given to the question and one result of that study is the conclusion that there is no one way to carry on industrial education effectively. Industrial conditions, educational possibilities, and other circumstances important to consider vary greatly with different localities. The problem of industrial education must be worked out with due regard to local industries concerned whatever name may be given to the schools that shall be established.

The great concern of the public school authorities, as has been pointed out in former editorials in the MANUAL TRAINING MAGAZINE, should be so to modify the elementary school system that it shall prepare for more specific forms of trade training and higher phases of industrial education. The elementary schools must always remain the natural source of supply for the army of skilled workmen which the industries need. The proper function of the so-called technical schools and of all industrial schools above the elementary grades, excepting the trades schools, is to train for leadership. The higher technical schools are already well developed and a good beginning has been made in the establishment of those of lower grade. What needs to be kept constantly in mind is that the weakest point of our public school system to-day is to be found in the lack of elementary industrial training leading directly to training for the trades.

Plan Suggested for Industrial School in Springfield, Mass.

The plans under consideration by the Springfield, (Mass.) school authorities for an elementary industrial school may be of interest to readers of the MANUAL TRAINING MAGAZINE. This plan contemplates a school entirely under the control of the city school authorities for boys fourteen years old or over who have finished the 7th grade of the grammar school and who wish to continue in school for the distinct purpose of preparing for some mechanical trade. It is proposed to offer a three years' course, during the first two of which the pupil must spend the entire school day of seven hours under the direct supervision of specially qualified teachers, and during the third year either the seven hours of each day *every week,* as during the previous years, or of *every other week,* the intervening weeks being spent as an apprentice in some local shop approved by the school authorities. It is further assumed that a fourth year of similar work, consistently planned and carried out, may be added if it is found desirable and practicable to do so. The school hours assumed are seven hours every day of the five regular days in the week, beginning at 8 A. M. and closing at 4 P. M., with one free hour between noon and 1 P. M., and from 8 A. M. to noon Saturdays. The third and fourth year may include a school day eight hours long if found practicable.

The course of instruction is planned with the definite purpose of preparing boys for entrance into the more important local hand-tool and machine-tool trades. The chief local trades considered are pattern-making, furniture making and repairing, woodworking, machine operating, house framing and finishing, plumbing and steam fitting, blacksmithing and machine forging, machine-tool operating, general machine-tool work, and tool making. It is the intention that the instruction shall be so planned and carried out that the vocational purpose of the school shall be strongly emphasized. All studies, while their importance is not to be ignored, are to be chosen and taught as subjects contributory to this industrial and vocational purpose. This implies, of course, that the teachers who are to have immediate charge of this work are to be chosen for their expert knowledge of the trades for which the pupils of the school are to be prepared.

The following is the program suggested for this new school:

FIRST YEAR.

First Term—16 Weeks	Hours daily.
Joinery	3
Drawing	1

English and Arithmetic, alternately	1
Penmanship and Accounts	1
Study	1

Second Term—8 Weeks

Woodturning	3
Drawing	1
English and Arithmetic, alternately	1
Penmanship and Accounts	1
Study	1

Third Term—8 Weeks

Ironwork, chipping and filing	3
Drawing	1
English and Arithmetic, alternately	1
Penmanship and Accounts	1
Study	1

Fourth Term—8 Weeks

Ironwork, speed lathe	3
Drawing	1
English and Arithmetic, alternately	1
Penmanship and Accounts	1
Study	1

SECOND YEAR.

First Term—	Hours daily.
Carpentry or Machine-Tool Work	3
Mechanical Drawing	1
Industrial Geography and American History, alternately	1
Shop Arithmetic	1
Study	1

Second and Third Terms—

Carpentry or Machine-tool Work	3
Freehand Machine Drawing	1
Industrial Geography and American History, alternately	1
Shop Arithmetic	1
Study	1

Fourth Term—

Carpentry or Machine-tool Work	3
Study of Working Drawings	1
Industrial Geography and American History, alternately	1
Shop Arithmetic	1
Study	1

THIRD YEAR.

Special work in one of the following—	Hours daily.
Carpentry	3 or 4
Machine-tool Work	3 or 4
Pattern-making	
Cabinet-making	
Blacksmithing	
Plumbing	
Steam Fitting	
Sheet Metal Work	
Special Drawings and Elements of Economics, alternately	1
Elementary Science and Civics, alternately	1
Shop Arithmetic and Business Correspondence, alternately	1
Study	1

FOURTH YEAR.

Extension of the special option in shop work, with further practice in shop mathematics, readings and discussions in industrial history, and in the principles of science that find application in the industries concerned.

—C. F. W.

ASSOCIATIONS

WILLIAM T. BAWDEN, Editor.

ILLINOIS MANUAL ARTS ASSOCIATION.

The Sixth Annual Meeting of the Illinois Manual Arts Association was held at the Rockford High School, Friday and Saturday, February 12 and 13, 1909.

The morning of Friday was spent in visiting the school shops in Rockford and also several manufacturing plants which were very kindly thrown open to members. This latter included the Skandia Furniture Co., manufacturers of china closets, sideboards, Viking sectional book cases, etc,; the Rockford Watch Company's factory and others. In addition to these and other places of interest about the city a number of commercial exhibits had been prepared by the local committee. These included displays of wood finishes and various items of tool and machine equipment.

By an unfortunate oversight it was not realized until too late that the date of the meeting conflicted with other engagements that prevented a large attendance. The Illinois Schoolmasters' Club held its semi-annual meeting on the same date at Bloomington and kept a number of men away. On Friday afternoon also special programs had been prepared in all the public schools of Rockford which prevented the local teachers and others from attending the meeting in as large numbers as was hoped.

The program opened on Friday afternoon with an address illustrated with stereopticon on "What Shall We Do with the Arts and Crafts?" by George W. Eggers, Director of the department of Graphic Arts, Chicago Normal School. This was followed by an address illustrated by charts and stereopticon on "Household Arts in the Elementary Schools," by Mrs. Alice Peloubet Norton, assistant professor of Household Administration, University of Chicago. It is hoped that some report of these two addresses may be given in a later issue, as they were very favorably received by those who heard them.

At five o'clock began the regular social hour and informal reception in the Auditorium and at six o'clock the Annual Banquet was served in the high school lunch room in charge of Miss Maude Parsons, Supervisor of lunch room, and Miss Ada Jenks, Supervisor of Domestic Science. Dinner was served to about fifty guests very acceptably by the young ladies of the Rockford high school. After the dinner the members and guests adjourned to the Auditorium where the evening program was presented.

After an address of welcome by Supt. P. R. Walker of Rockford, the leading address of the evening on "The Albert G. Lane Technical High School; Its Equipment and Its Aim," was delivered by Principal William J. Bogan. This address presented a very interesting account of the equipment of what is probably one of the finest technical high schools in the country at the present time. At the cost of about three-fourths of a million Chicago has attempted to solve

the problem of providing the young people of that city with opportunities for technical secondary education. In addition to the work that is done in the day classes extensive opportunities in evening classes are offered to those who are at work during the day.

The President's address, "Our Heritage," was delivered by Louis H. Burch, Director of Manual Training, Western Illinois State Normal School, Macomb. He said, "I come from the part of the state in which there are few high schools that offer any courses in manual training. Our high school conditions are very different from those described by the last speaker and yet we too have our problems.

"Too many of the teachers think the subject of manual training seems very much of an innovation. Those who are not familiar with the history of education do not realize that from very early times educational leaders and reformers have advocated systems of education in which manual training should have a part, but the masses of the people have not been in sympathy with the idea. Of recent years this attitude has been greatly changed. I wish to speak for a few moments of "Our Heritage," the magnificent opportunity before us.

"Just now is a critical time in the development of our work. Demands and requests to know what to do come from the schools in all directions. The important question for us now is, can we demonstrate to the patrons of our schools that manual training supplies a real need?

"We need to meet the demand for more work in the Manual Arts in the school and have a better understanding of the work on the part of the regular teaching force. I suggest that the members of this Association should consider the question of establishing a Manual Arts Section in the State Teachers' Association and the various Associations of Illinois."

The report of the work done during the year was presented by the secretary, Ira S. Griffith, Supervisor Manual Training, Oak Park Public Schools. The secretary reported that letters of inquiry had been received from interested workers in Iowa, Oklahoma, and New York asking for information with reference to the organization and method of the Illinois Manual Arts Association and asking for copies of the Constitution and other literature. In at least two of these commonwealths Associations have been organized during the past year.

At the business meeting following the program a nominating committee was elected by ballot consisting of A. C. Bloodgood, Aurora, chairman, C. S. Van Deusen, Peoria, and F. H. Selden, Chicago. The president also appointed the committee on resolutions with C. S. Van Deusen chairman.

The Saturday morning session was begun shortly after nine o'clock with a business meeting. The treasurer presented a report showing a balance of about $45. The committee on resolutions presented a report expressing the appreciation of the members for the courtesies extended by the various manufacturing concerns and the entertainment by the Rockford Public Schools.

The selection of a meeting place for 1910 presented a difficult choice from the invitations that had been presented to the Association by the public schools of Jacksonville and Springfield and by Lewis Institute, Chicago. Upon motion it was voted to accept the invitation sent by the Jacksonville schools and to meet there next year.

The report of the nominating committee was presented by A. C. Bloodgood, Aurora, chairman, as follows: for President, Leonard W. Wahlstrom, director of Manual Training, Francis Parker School, Chicago; for Vice-President, Samuel J. Vaughn, director of Manual Training, Northern Illinois State Normal School, DeKalb; for Secretary-Treasurer, Wilson H. Henderson, director of Manual Training, Public School Department, Springfield. The report of the committee on amendments to the Constitution was presented by Harvey G. Hatch, chairman, Rockford. After considerable discussion it was decided to do away with the election of members. The Constitution was so simplified that any person interested in the work of the Association may be become a member upon payment of the membership fee of $1 per year without the formality of an election.

The following new members were enrolled at the 1909 meeting: William J. Bogan, principal, Lane Manual Training High School, Chicago; Wilbur M. Graham, instructor in mechanical drawing, Springfield High School; W. H. Haupt, instructor in woodworking, Rockford High School; Tasso Lindsey, instructor in shop work, Oak Park Public Schools; Eugene D. Merriman, principal, North Belvidere High School; John A. Seefelder, instructor in manual training, Freeport High School; William Todd, instructor in Manual Training, Geneseo High School; Samuel J. Vaughn, director Manual Training, Northern Illinois State Normal School, DeKalb; Leonard W. Wahlstrom, director of manual training, Francis Parker School, Chicago; R. J. Watson, instructor in manual training, Aurora High School; Carl N. Werntz, director, Academy of Fine Arts, Chicago.

The greater part of the morning was spent in a discussion of the report of the committee on "Course of Study in Manual Training for Elementary Schools." The committee consisted of H. G. Hatch Rockford, chairman; Fred D, Crawshaw, assistant Dean, College of Engineering, University of Illinois; Miss Anna G. Brown, Jacksonville High School; F. H. Flagler, Peoria, and S. J. Work, Elgin. The report of the committee was presented in the form of a printed pamphlet which had been mailed to the members several weeks in advance of the date of the meeting. The discussion was opened by the chairman of the committee.

The outline of the committee's report stated as its purpose the formulation of a basis for a course of study in the manual arts. "It is imperative that each individual see his work in its larger relations. This demands greater intellectual capacity and greater breadth of knowledge; greater understanding of human achievements and ideals.

"The adjusting of a more effective social life is helped or hindered by various causes. Home life furnishes few interests or activities to the child. The elementary school is still very academic in character, furnishing the child only meager preparation for the industrial plans of life. In the factory often only a small amount of skill is required, as in the running of machines that are nearly automatic. The workman does not get a mental grasp of the whole process about which his work is related, nor does he understand the relation of the finished product to the community. The confining and automatic character of the work is deadening. The worker has very little sense of responsibility for his work. The unimportant character of the work gives the worker small sense of self valuation.

"The school has been used by society for the purpose of assisting the child in the process of education. The activities relating to the industries which are essential in the child's education and are not supplied by other institutions, should become a part of the concrete work of the school.

"The function of the Manual Arts includes: 1st, To develop a kind of general skill involving the use of simple tools which will enable the child to work over many common materials; 2nd, A sense of responsibility toward his work and joy in the doing of it; 3rd, A realization that self-valuation is measured by power to accomplish; 4th, Habits of purposeful doing; 5th, Appreciation of the dignity of labor and respect for the laborer; 6th, Some sense of the relative value of labor and materials in the finished product; 7th, Ability in the use of the mechanic's written language—mechanical drawing; 8th, Knowledge in the processes and evolutionary history of several typical industries, what they represent as human achievements, and what relations they bear to present social life; 9th, A sense of the social value of different occupations so that the child will acquire some judgment in selecting his future vocation; 10th, An understanding of productive value of labor as dependent upon degree of skill and intelligence involved; 11th, Realization that the working out of any common purpose involves necessary relations of interdependence and co-operative effort."

Mention should be made of the excellent music provided for the afternoon and evening sessions on Friday by primary pupils from the Freeman school and by the Girls' Glee Club of the Rockford High School. The printing of the programs for the meeting and the stationery used by the Association during the year was done by the pupils in the high school printing shop.

While this meeting of the Illinois Manual Arts Association was not so largely attended either by local guests or members from out of the city as some of the previous meetings, nevertheless it was voted a distinctly successful and profitable meeting by all who were present.

DEPARTMENT OF SUPERINTENDENCE.

The annual meeting of the Department of Superintendence of the National Education Association was held in Chicago, February 23, 24, 25, 1909. Headquarters were at the Auditorium Hotel and the general sessions were held in the Music Hall of the Fine Arts Building. The round tables and other meetings were held in various rooms in the Auditorium Hotel. The third edition of "Bruce's Bulletin" contains about 1,800 names of those present at the meeting.

On the evening of Monday there were held Dedicatory Exercises of the new Albert G. Lane Tchnical High School. The building was open for inspection and the shops were in operation from noon to five P. M. The exercises included addresses by Otto C. Schneider, President of the Chicago Board of Education, Principal William J. Bogan, President Nicholas Murray Butler of Columbia University, and Superintendent L. D. Harvey, Menomonie, Wis., President of the N. E. A., and others.

President Schneider criticised the "reformer with a notion and a theory," and "impractical education with its wholly unsuited curriculum." The ultimate end of all educational improvements should result in equal opportunity be-

ing offered to all who wish to enjoy the fruits of their labor, whether this be in a purely intellectual field or in the mechanical pursuits."

"We should boldly face the fact that only a small percentage of those who enter high school ever enter college," said Principal Bogan. "Once we admit that the demand of the majority deserves more consideration, we are forced by the exigencies of the situation to make radical changes in our courses of study. The inadequacy of the public school curriculum to hold our spirited boys for so long time been evident.

"I often wonder what it is in our make-up as teachers that impels us to gaze at our work through the telescopes of tradition and precedent, which magnifies the importance of Greek, Latin, and ancient literature, while we ignore the pitiful sight of mankind on its knees praying in all its terrible literalness: 'Give us this day our daily bread.' Why not get rid of teaching the superficialities?"

Dr. Butler delivered an eulogy on Albert G. Lane, for whom the school was named, and on behalf of the widow and children of Mr. Lane presented a photograph of the educator who was connected with Chicago schools for more than fifty years, rising from the ranks to superintendent.

The high school has accommodations for 1,800 students.

The Tuesday morning session concerned itself with the topic, "The Elimination of Waste in School Work," with papers by Supt. J. B. Richey, McKeesport, Pa., Junius L. Merriam, University of Missouri, and others. The evening session discussed the need of articulation of higher educational institutions with the secondary schools. The first paper was by Supt. Stratton D. Brooks, Boston, who emphasized the proposition that the University should be "mother of men," as well as "nurse of scholarship." There has been a decided change in the function of the high school. It is no longer preparation for college entrance. The chief business of the high school to-day is to train pupils for a place in community life, to train the individual for helpful service. The high school of today is fundamentally a vocational school in that its graduates largely go directly into vocations. The greatest necessity now is the waiving of uniformity. The high school must adapt itself to the vocational requirements of its pupils and the university must adjust itself to the requirements of the high school condition.

The second paper was by Robert J. Aley, University of Indiana, who criticised the present tendency of the high school to become a "college in miniature, having for its atmosphere air drawn from the lower layers of university life and for its aim the preparation for college entrance. A few years ago boards of education were wont to regard the A. B. stamp as practically the same as O. K., but they are getting to be more discriminating now."

Supt. Charles E. Chadsey, Denver, emphasized two objections to the offering of vocational courses in the high school under present conditions: 1st, courses which do not prepare for college are often regarded as inferior; 2nd, those students who are awakened by vocational training are often disappointed to find that no credit is given for this work toward college entrance.

State Supt. Charles P. Cary, Madison, Wis., in a paper on "Proposed Changes in the Accrediting of High Schools," called attention to the fact that one of the greatest evils of conditions to-day is that the "average" student is

deprived of college privileges in that the colleges take only the cream of our intellectual life. "It has been claimed that the preparation that is best for college is best for life. This is a sweeping generalization that has in the past given great comfort to college authorities; but who is better prepared to say that four years of Latin is better preparation for life than four years of well organized and well articulated manual training? The only thing that the university need be concerned about is, has the work that has been attempted been thoroughly done? and has the pupil acquired the necessary intellectual habits and maturity?"

Supt. William E. Chancellor, South Norwalk, Conn., in a paper on "Some Personal Relations of College and High School," said, "Christianity has taken hold of elementary education to try to make it universal, democracy has taken hold of secondary education and tried to make it common, but the higher education has not yet partaken of either Christianity or democracy."

The Tuesday evening session considered "The Problem of the Delinquent Pupil." Strong criticism was offered on the whole system of parental or reform schools, and the opinion advanced that the boys and girls who are sent to such institutions have very poor chances of becoming of any use either to themselves or to society. Bert Hall, truant officer of the Milwaukee public schools, insisted that delinquents should be sent to institutions only as the very last possible resort intead of the first.

"The plan of sending delinquents to farm houses instead of to institutions," said Mr. Hall, "has been tried with success in Wisconsin. We have sent many boys to farms, and they have done splendidly. The tough boy of the gutters, who chews tobacco, smokes cigarettes, swears and steals, becomes a fine, manly, upright, ambitious boy when removed from the vicious surroundings of the streets. Boys on farms change their characters and respond readily to good influences."

Mr. Hall stated that virtually all the boys charged with delinquency in Milwaukee are cigarette smokers.

Miss Julia Richman, district superintendent of public schools of New York City, urged that the National Education Association undertake a fixed program of work for the future in regard to the problem of delinquent children.

Miss Richman declared that social settlement workers might well become teachers in the public schools rather than devote their energies to the settlements.

The topic for the Wednesday morning session was, "The Schools in Relation to Character Building." Miss Ella Lyman Cabot, member of the Massachusetts Board of Education, in a paper on "Ethical Training in Schools," said: "Improvement in character may take place in three ways: (a) by imitation; (b) by responsibility shouldered; (c) by learning to think straight. Three things that teachers of ethics must not do are: (a) they must not preach; (b) they must not point a moral finger at any one particular child; (c) they must mean and practice what they say. Three things that the teaching of ethics may accomplish are: (a) correct tendencies to wrong acts and judgment; (b) clear up misconceptions and confusion as to right and wrong; (c) forestall moral vaccillation.

Pres. John W. Abercrombie read a strong paper on the American peril, "The Spirit of Lawlessness."

The round table of superintendents of smaller cities met on Wednesday afternoon with "Industrial Education" as one of the topics under discussion. Supt. A. C. Thompson, Auburn, N. Y., quoted G. Stanley Hall to the effect that the children on the farms of a generation ago learned the rudiments of at least seventy trades. One of the greatest problems of to-day is that of deciding which of the many occupations elementary schools should be concerned with. Some years ago Mr. Thompson questioned 467 children with reference to the vocation that they proposed to follow in after years. Eleven years later he obtained information from 406 out of the original number and found only five of these following the vocation originally proposed.

Supt. J. M. Frost read a paper describing the equipment and plans of the Hackley Manual Training School, Muskeegan, Mich. This was followed by a paper by Supt. C. B. Gibson, Columbus, Georgia, giving a description of a vocational school in Columbus. This school with an equipment costing something over $100,000, holds its sessions the year round except August and observes regular working hours daily. Candidates for graduation are expected to spend two months at work in shop, factory or business house. There are occasional complaints and some little difficulty of adjustment on the part of the new students to the long school hours, but graduates find very little difficulty in making the adjustment to the work hours of factory or shop. Supt. Wilbur F. Gordy of Springfield, Mass., described the vocational schools under his direction. The school is in session daily six or eight hours for forty weeks. During the first year the pupils are tested to see whether they have any mechanical capacity and in what direction. About two-thirds of the time is spent in woodworking, joinery and turning, and one-third of the time in iron with drawing throughout the year. The second year the student is expected to elect to work in wood or iron. Throughout both years certain academic subjects are studied also.

On Wednesday afternoon the department held a joint session with the American School Hygiene Association with papers by Supt. William H. Maxwell, New York City, and George E. Johnson, superintendent of Play Ground Association, Pittsburgh. Dr. Woods Hutchinson spoke upon the health of school children. Dr. Hutchinson criticised two conditions especially of the modern educational institutions: 1st, the confinement of the children in the stuffy room for five or six hours daily. He must begin by following precise and arbitrary rules and must not even wiggle in his seat. In the second place, much time is wasted by teaching a child things that he would learn instinctively. The boy with reasonably intelligent parents and surroundings will make his own start toward mental development.

"You don't know what the young human animal has in him," he said. "You will admit that the colt will grow up to be not a cow but a horse; but you are terribly afraid that if you don't condemn the child to hard and repugnant labor in a stuffy room, in an uncomfortable seat, without even the divine right of wiggling, that it will turn out to be some horrible monstrosity."

"The child is taught to bound Afghanistan, but cannot bound a single vital organ of its own body. In fact, if it could it would be considered highly im-

proper, indeed immodest. I believe most of you are sorry your brains cannot walk alone.

"The aim of the school is purely mental—the training of the mind. With this, we, as physicians, have no right to interfere. But when it becomes necessary for the purpose of the child's mental education to take his body into custody and hold it in confinement at hard labor for two-thirds of his working day, then the physician has a right to be heard. To such an extent has this school room sentencing of children to an educational treadmill gone that it has actually become necessary for us to choose between a child's education and his health."

"Instead of education being a harmonious scheme for promoting the entire development of the child—body, mind and morals—it has become a systematic effort to promote his alleged mental development with an utter disregard, and often at the sacrifice of, both health and morals. This standard is set by the community, not the teacher."

"The trouble with our schools is not that they teach the child too much but that they teach him so little in proportion to the outrageous amount of his time that they waste. Two-thirds of our purely mental drill and disciplinary training in the schoolroom is as ineffective and as irrational as trying to develop a flower by massaging its petals, instead of tending to its roots.

"The ideal school of the future should be about one-fourth workshop, one-fourth garden, and two-thirds, play. The best preparation for success is not to teach a child to work, whether it likes it or not, but to teach it to love its work."

"This the unspoiled young of the human species is eager and ready to do if he is only given a chance to grow into it naturally. Our present method of forcing things down his throat months and years in advance of his readiness for them, acts simply to disgust him with the whole process."

"If our schools will simply push forward to their full legitimate conclusion the magnificnet improvements which they already have begun in the direction of manual training, gymnasium, trade schools, school gardens, and school playgrounds, reducing the hours of confinement to less than two hours a day and developing the whole child symmetrically instead of just the brain bulb at his upper end, the real millenium of health, of happiness, of personal righteousness and civic devotion will come without our having to go to heaven to get it."

The general topic at the Thursday morning session was Industrial Education again. The dignity of vocation was the topic of a paper by Kenyon Butterfield, President of the Massachusetts Agricultural College, Amherst, read by Charles S. Howe, of Cleveland. This paper was written under the conviction that vocational training properly administered is educational.

"We must first determine the place of vocation in life. As vocation is the only means of livelihood for most men, the dignity of labor is important. Second, vocation is essential to family life. The character of the vocation will determine the character of the family life. Third, the vocation is the chief means of social service for most people. Fourth, for most men the vocation is the chief means of self-expression of ideas and ideals. But admitting that it is important it would not be all of life. There ought also to be leisure."

Dean Davenport, College of Agriculture, University of Illinois, discussed

the question "Shall Industrial Education be Treated as a Phase of General Education?" He said: "We as a people are committed to the policy of universal education. Industrial education is really only a part of universal education. All men need a two-fold education: first, to fit them to live, and second, to fit them to work. There are three things that can interfere with the development of the high school: first, the movement toward separate industrial schools, trade schools in the cities and agriculture schools in rural communities; second, the attitude of those few admirers of the old education who seem determined to teach nothing that can possibly be of any use; third, the difficulty of adding to the course of study and equipment and molding it into unity rapidly enough to meet the conditions. The results we may expect from (1) above are as follows: first, we may have as many different schools as there are industries; second, the vocational future of the individual pupil would then be decided not by intelligent choice but by convenience of location of the schools; third, vocational education would be given only in industrial schools and the high school would presently lose its hold on American life; fourth, industrial schools will necessarily be inferior in quality; fifth, the choice of vocation would come too early for most boys; sixth, if the industries are in separate schools the plan would result in a division of the people into classes."

Elmer E. Brown, U. S. Commissioner of Education, spoke on "Industrial Education as a Nationaal Interest." He said: "There is danger that the new industrial education will be made too like the old education to accomplish best its purpose. It must have a close connection with the old but it must not sacrifice the new. The country child must be free to take up any career, in city or country, but country life must be permitted to make its proper and adequate appeal to the individual as well as city life. This national problem of industrial education must be solved by industrial workers, business men, politicians and educators in co-operation, but the educators must take the lead.

"Continuation Schools" was the subject of a paper by Supt. E. G. Cooley, Chicago. He disclaimed any intention of making an assault on the high schools but he insisted that as at present organized they are catering to a pitiful small proportion of the community.

"There are in the United States 32,000,000 bread winners. Of these 2,000,000 are in the professions or trained pursuits, and the remaining 30,000,000 toil with their hands. We are devoting much too large a proportion of our time to this 2,000,000. All courses of study were originally taken up with some idea of utility, but to-day even the technical school is confining its effort to those who are preparing to enter some one of the professions."

"I am unalterably opposed to the introduction of trade instruction in the elementary grades, but when the age is reached where the child is to choose between continuing at school and going out to work with his hands he should have the opportunity of learning to become a better carpenter or mason. What we need is to organize a continuation school, which shall be the high school of the working man."

"The evening school should be run the year round, to give the poor boy who is forced to spend the day at work the same opportunity to secure an education as has the more fortunate boy who is preparing to enter the professions."

"Why should the high schools be kept up at all hazards while the night schools are cut down at the first lack of funds, and at most kept open only about four months in the year? I would keep them open the year round, and, more than that, open similar day schools, make the attendance compulsory, and place he responsibility on the employer and the parent."

"It is not from organized labor that we must fear opposition from such a venture. Though the labor union has the same rights as have the lawyers and the doctors, to oppose short cuts to their callings, continuation schools, where established have not been greatly opposed. It is the taxpayer who is the principal obstacle in the way of this progress."

Jesse D. Burkes of the Teachers Training School, Albany, N. Y., spoke on "Getting Our Bearings on Industrial Education." He emphasized the necessity of making a distinction between elementary and secondary education. In the elementary school the likenesses are more significant than the differences. Whenever in the development of children the differences in disposition, tastes and ambitions become of more importance than the likenesses the secondary period has *de facto* begun. So long as we fail to recognize the fact that this period begins at the seventh and eighth year of school we may expect pupils to leave the schools.

At the business session on Wednesday morning the following officers for the ensuing year were elected: President, Stratton D. Brooks, Boston; First Vice-President, W. C. Martindale, Detroit; Second Vice-President, Miss Julia A. Richman, New York City; Secretary, J. F. Keating, Pueblo, Colo.

After considerable discussion of the merits of various meeting places the Department decided by a close vote to meet next year in Indianapolis, Ind.

WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

The sixteenth annual meeting of the Association will be held in St. Louis, Missouri, from May 4 to 7, 1909.

The program committee, Mrs. Matilda E. Riley, chairman, has arranged comprehensive plans for this session, which will provide for the following interesting departures:

The day session will be confined entirely to the forenoons from nine-thirty to one, beginning each morning with a round table discussion of some vital topic led by a noted authority whose views in combination with the resulting discussion by other eminent speakers will command the interest of all members. These discussions will be adequately reported and published. This round table discussion will occupy half of each morning session, the latter half of each meeting being devoted to papers and addresses by foremost educators.

There will be no formal program in the afternoon, that time being kept free for inspection and study of the exhibits, which promise to cover the correlation of graphic and manual arts more adequately than usual, and also for the visiting of schools and other places of interest.

Tuesday evening, May 4th, will be devoted to an opening meeting, with an address by a prominent speaker in addition to the usual addresses of welcome and music.

Wednesday evening there will be a lecture by a man of national reputation; music, etc.

Thursday night a general reception or banquet will be arranged with a toastmaster and several good speakers.

An effort is being made by the President to interest all the members in securing a larger membership and all are invited to help in this matter and also in securing interesting exhibits. A request is made that all members who know of friends who will be benefited by joining the Association send the names to the president that a formal invitation may be extended to them to join the Association.

The Local Exhibit Committee of St. Louis has issued a bulletin urging superintendents and directors to attend the meeting and to send a representative body of teachers, granting permission to certain teachers to attend without loss of salary and in some cases defraying traveling expenses of these representatives.

The Exhibit Committee invites complete exhibits of Art, Manual Training, Mechanical Drawing, Arts and Crafts, Domestic Art work, and offers to pay freight on such manual training exhibits up to 500 pounds in order that a more representative exhibition of this work may be made, provided the requests for freight charges do not exceed the amount placed at the disposal of the committee for this purpose. Applications should be made at once.

For copies of bulletins, apply to R. A. Kissack, Acting Secretary, Yeatman High School, St. Louis, Missouri.

PENNSYLVANIA.

Supt. Charles S. Foos, Reading, who is president of the Pennsylvania Educational Association,, recently distributed several thousand copies of a circular letter in a systematic campaign to extend the membership list and influence of the Association. He says, "In order to accomplish a more successful organization I am making an investigation of other State educational organizations, and, so far as membership is concerned, I am not encouraged to compare Pennsylvania with other states. Connecticut enrolls 90 per cent of its teachers; Rhode Island, 88 per cent; New Jersey, 65 per cent; Alabama, 18 per cent; California, 27 per cent; Idaho, 25 per cent; New Mexico, 50 per cent of its teaching force.

"The executive committee proposes to make the State Educational Association a more important factor in Pennsylvania educational affairs. The fifty-third annual meeting will be held at Bethlehem, June 29 to July 1, 1909. Supt. Robbin and the Bethlehem people are making extensive preparations for a large convention.

"The Association is made up of eight departments: Child Study, Nature Study; County Supervision; City, Borough and Township Supervision; School Directors; Kindergarten; Manual Training; and High Schools. In addition to the general meeting, four departments hold sessions at Harrisburg, as follows: High School, December 28-30, 1908; Borough and Township Supervision, February 2-3, 1909; County Supervision, February 3-4,; and School Directors, February 4-5."

At the New Mexico Educational Association, Silver City, December 29th, 1908, Hugh A. Owen, supervisor of manual training in the New Mexico Normal School, read a paper on "The Demand for the Practical in Education," in which he showed the unpractical nature of an education for the many based upon a training designed for the advantage of only the few. He advocated extension of the work in such lines as stenography, typewriting, commercial forms, salesmanship, and the handicrafts.

A conference of eminent educators and physicians for the purpose of securing a closer welding of medical training and liberal learning will be an important feature of the second midyear meeting of the American Academy of Medicine, to be held in the Auditorium Hotel on March 25.

The American Academy of Medicine is an organization specializing in medical sociology and is composed of physicians who have in addition to their special training a general cultural equipment. Assisting on the programme will be such men as President Charles F. Thwing of Western Reserve University, President George E. McLean of the State University of Iowa and President Thomas McClelland of Knox College.

These educators will appear on the evening programme of the conference in a symposium on the subject of "What Constitutes a Liberal Education in the Twentieth Century?" Among those who will take part in the morning program are Dr. Walter M. Miller of the University of Missouri, dean John L. Heffron of the Syracuse University medical department, President John H. T. Main of Iowa College, Dr. Charles McIntire of Easton, Pa.; President W. A. Mills of Hanover College, Dr. Edward Jackson of Denver and Dr. M. A. Brannon of Fargo, N. D.

OHIO.

At the meeting of the North Eastern Ohio Teachers' Association held in Cleveland, Friday and Saturday, February 12 and 13, the drawing and manual training teachers both held interesting round tables. At the meeting of drawing teachers the following program was presented: Leader, J. J. Rogers, East Cleveland; "How Mechanical Drawing Should be Taught in the High School," by Frank E. Mathewson, Technical High School, Cleveland; "Educational Influence of the Art Exhibit at the International Congress of 1908," by R. B. Farnum, Cleveland School of Art; "Some Problems in Artistic Handicraft," by Miss Florence Beck, Glenville High School; "Teaching of Color in the Public Schools: (a) Materials and Methods of Use; (b) Results for Which We Should Aim." by Miss Cora Parsons, Youngstown.

At the manual training round table Geo. A. Seaton was the leader and the following program was presented: "The Diminishing Wood Supply and Its Effect Upon the Manual Training Courses of the Coming Years," by S. O. Champion, Lakewood; "Metalworking in the Elementary Schools," by William E. Roberts, Cleveland; "What Equivalent Work Should be Offered to the High School Girls?" by W. H. Lambirth, Central Manual Training School; "Aids to the Work of the Shop Teacher," by E. H. Masters, South High School.

The winter meeting of the Cleveland Manual Training Club was held at Finley's, January 30th. Dinner was served at 6:30. The program of the evening consisted of a paper on "Forestry," by C. M. Williams of Elyria, Ohio. The interest manifested in the discussion which followed Mr. Williams' paper was probably the greatest shown at any meeting of the club. A committee was appointed to work in co-operation with the City Forester in creating an interest in trees and their protection among pupils of the schools. The club membership has passed the fifty mark.

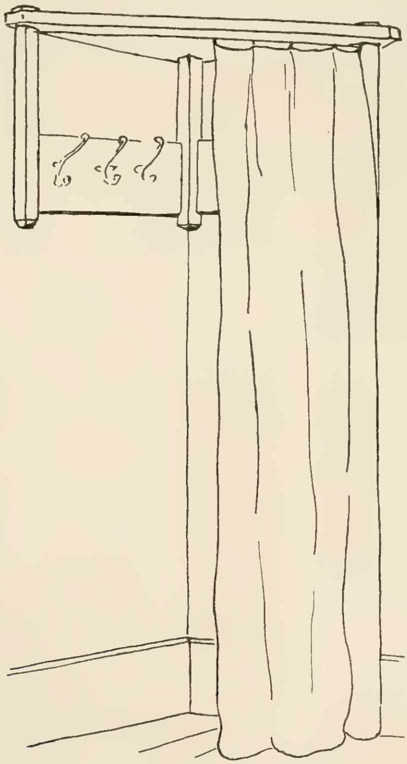
The Manual Training and Drawing Teachers' Association of California and the Domestic Science Teachers' Association have united under the name of The California Teachers' Association of the Manual Arts. It is hoped that the Association may thus prove more useful. Under the main organization are sections for the detailed study of Manual Training, Art and Drawing, and Domestic Science. The executive committee is composed of the President and Secretary of the Manual Arts Association and the Presidents of the three sections. Section meetings are held frequently for the discussion of methods, etc., and general meetings are held at least twice a year.

SHOP PROBLEMS

GEORGE A. SEATON, Editor.

DESK.

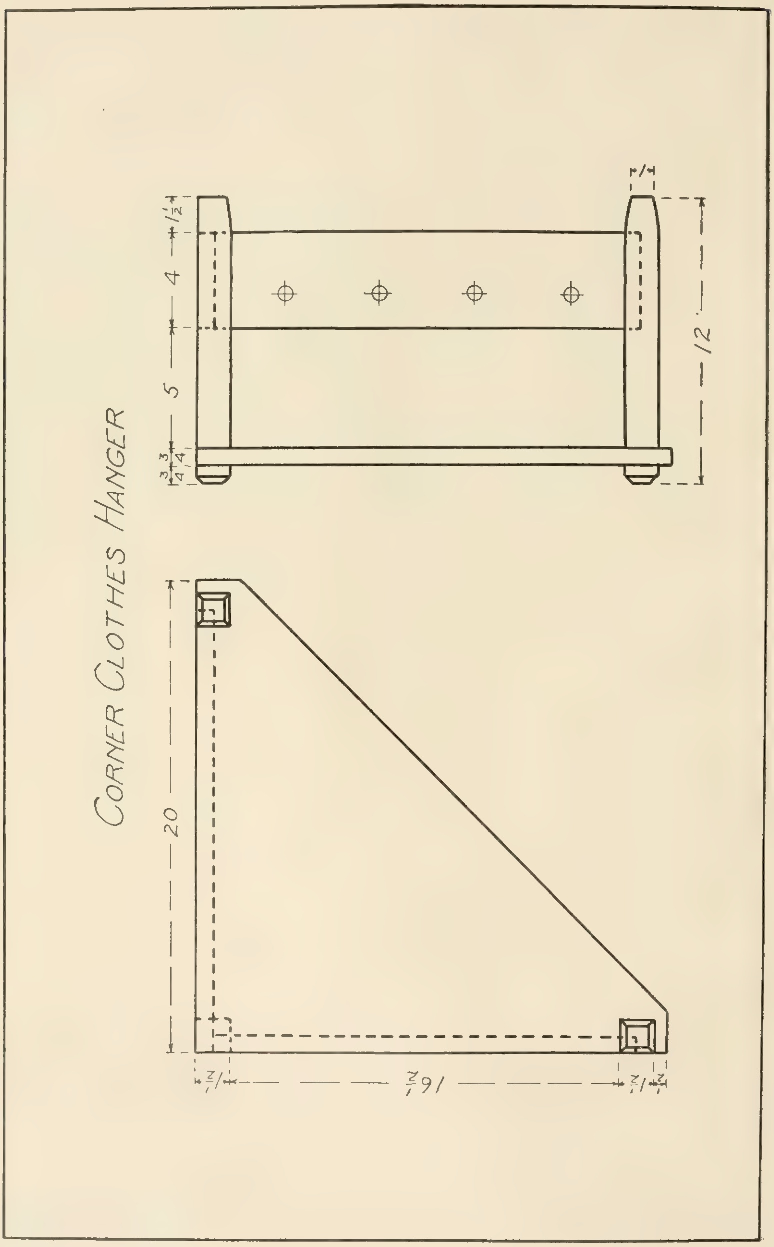
Where a small desk is desired nothing will prove more satisfactory than the one which has been designed by W. E. Roberts of Cleveland. The very simplest of outlines have been shown but these can be varied in a number of different



ways. The usual pigeonholes are omitted because the desk is so shallow. In their place are a couple of pockets just hinted at by the dotted lines of the end view.

CORNER CLOTHES HANGER.

Those of us who must dwell in the city with its flats and small modern houses will be quick to appreciate the worth of the corner clothes hanger which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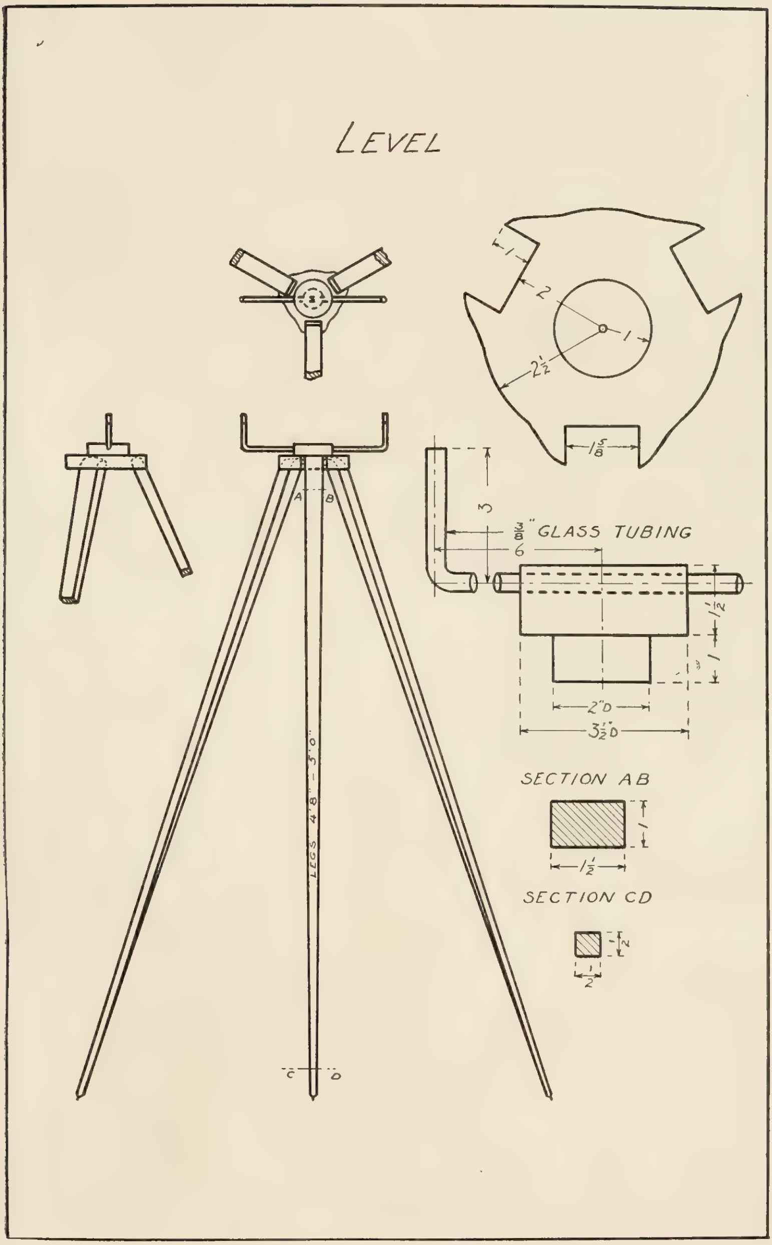
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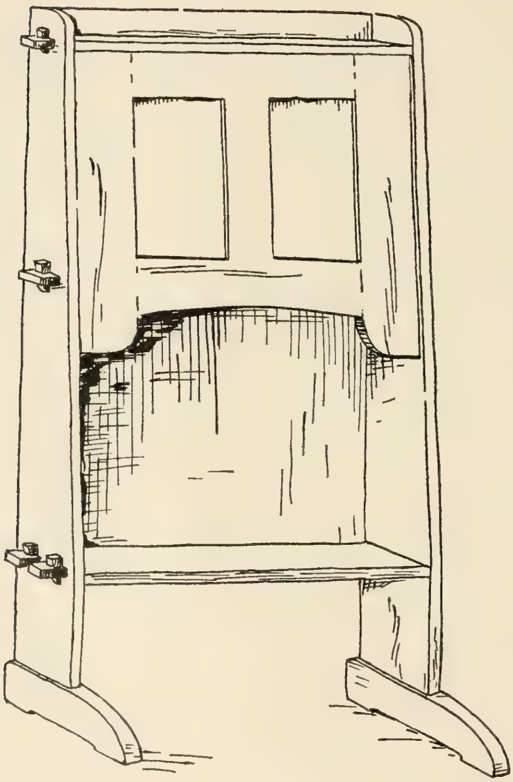

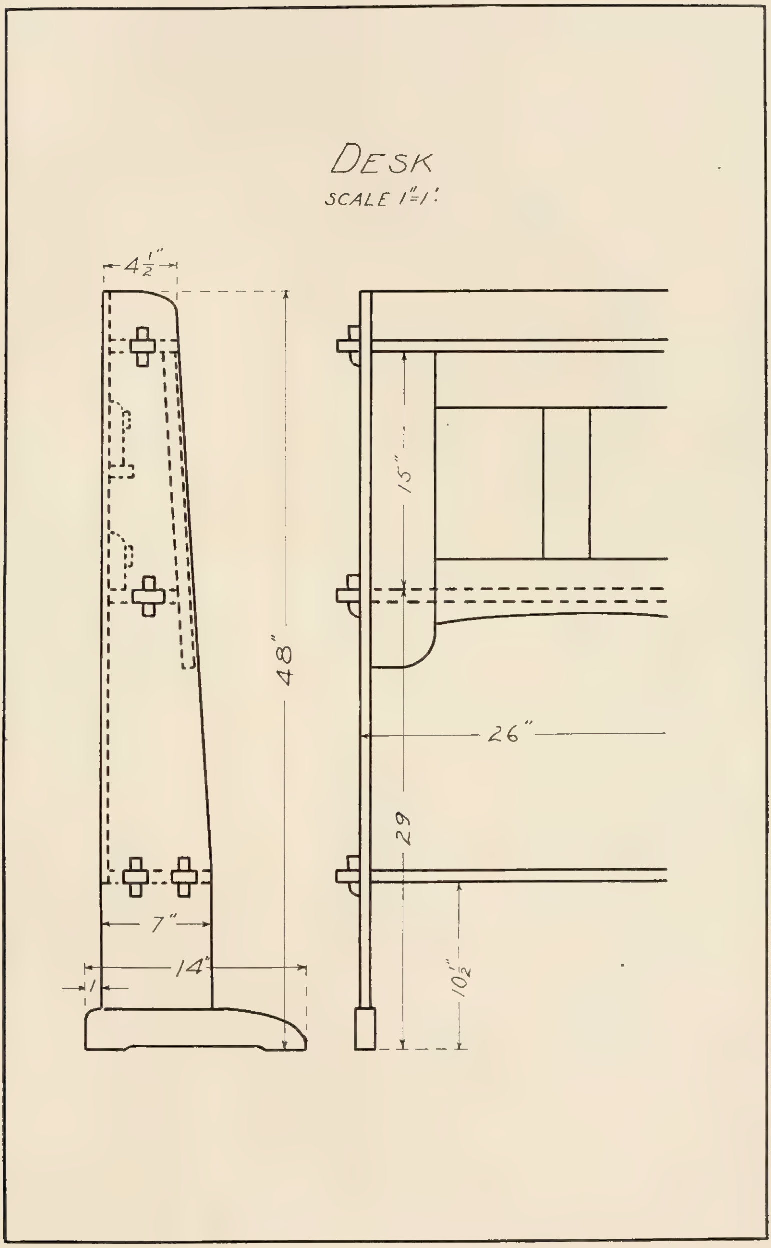
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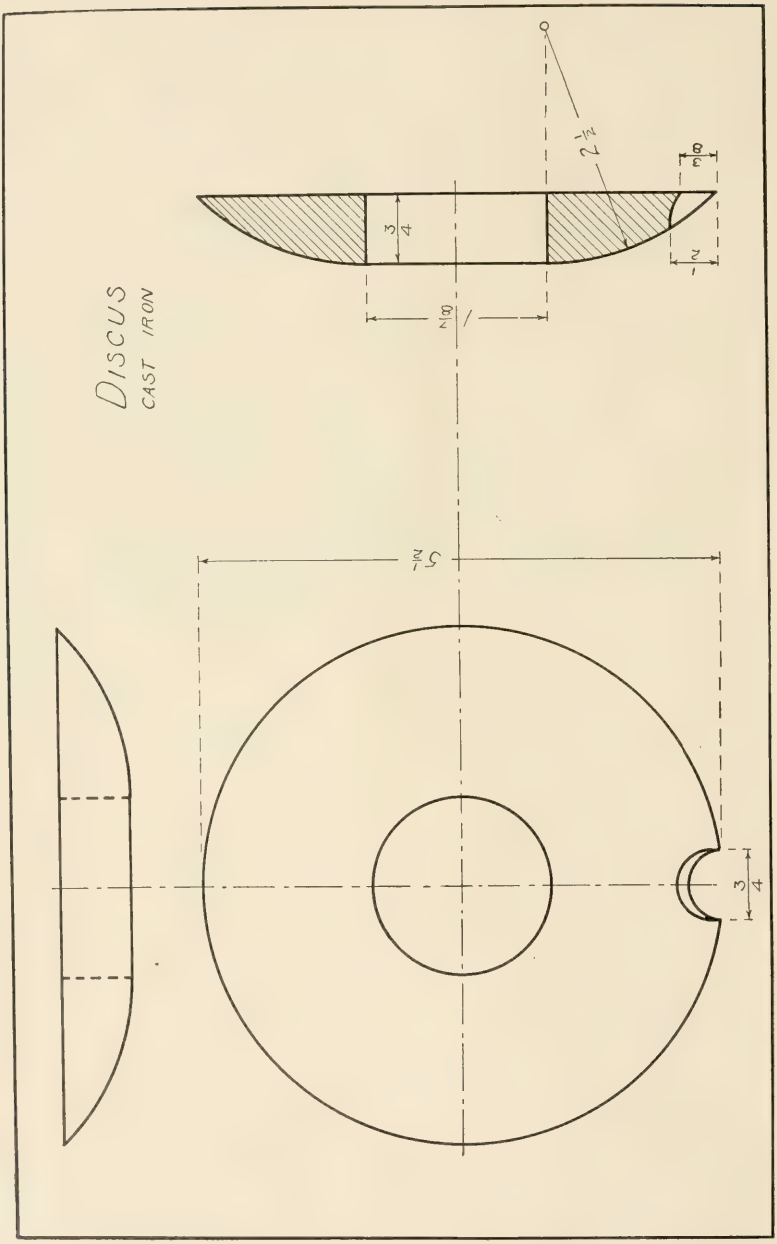
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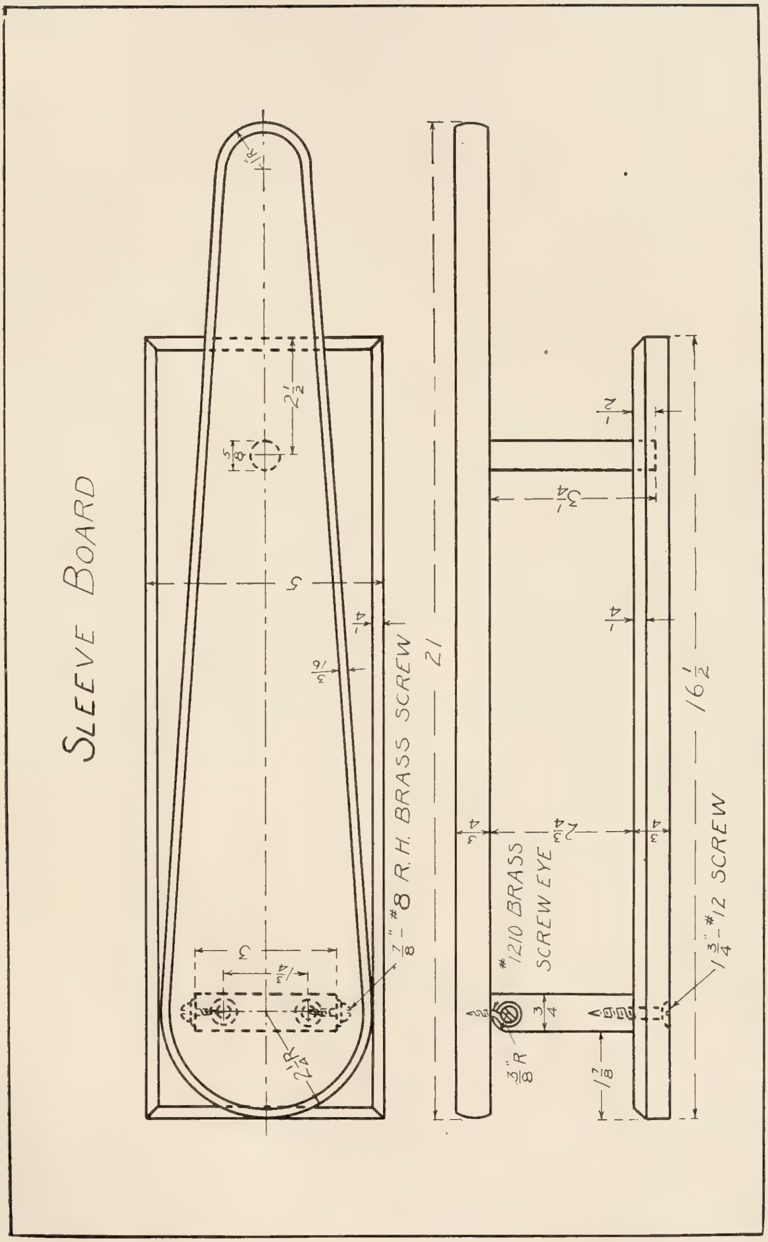
SLEEVE BOARD
7/8" - #8 R.H. BRASS SCREW
#1210 BRASS SCREW EYE
1 3/4" - #12 SCREW
21
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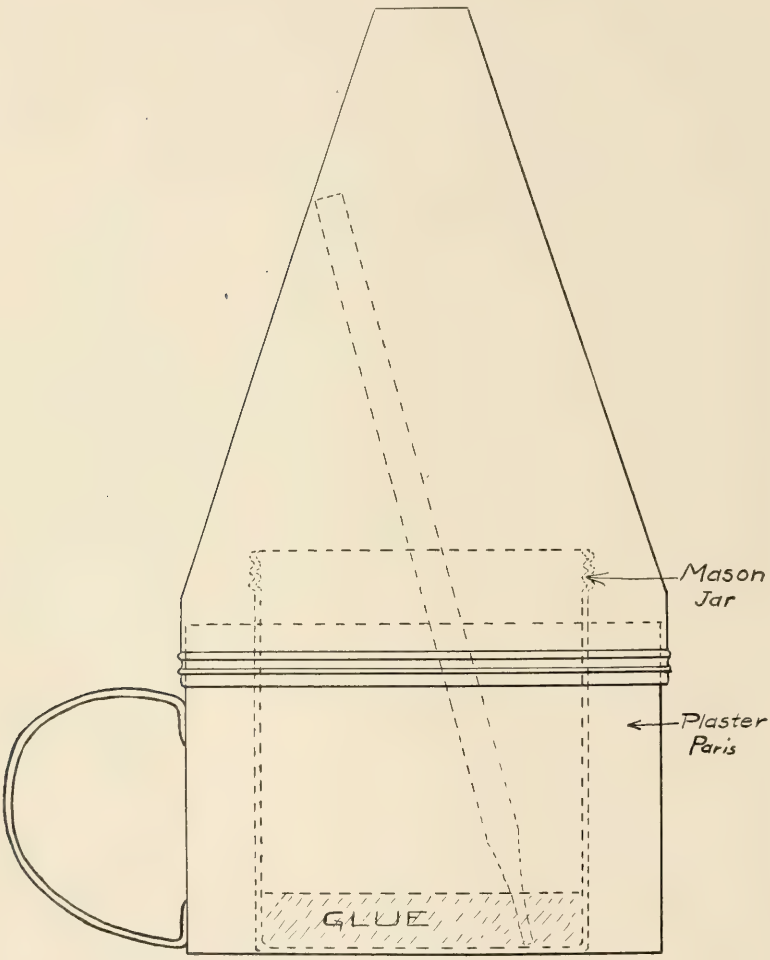
3/8" R

has been planned by Hans Schmidt of St. Paul. Its convenience and ease of construction should make it a popular project.

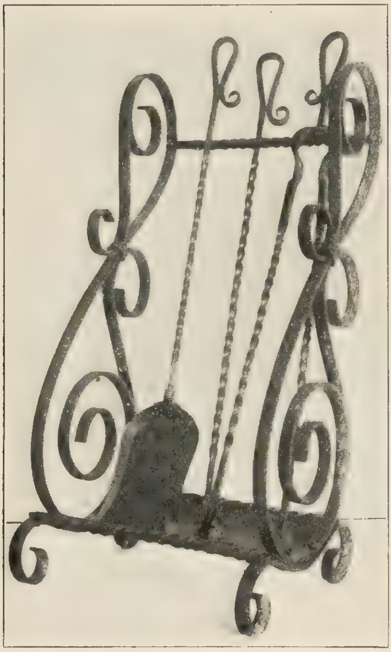


GLUE CAN.

Mr. L. W. Wahlstrom of the Francis W. Parker School, Chicago, writes the following about the drawing of the glue can which he has submitted:

"The question of the proper care of glue is often a troublesome one, especially in the small shop where facilities for heating glue may not be provided. In the majority of school work shops prepared glue is used, in cans of varying size, from a half pint to a quart or more. In ordinary use perhaps as much glue is

wasted on the sides and top of the can as is actually used. To overcome this difficulty the arrangement as given in the drawing has proven most satisfactory. It consists of an ordinary varnish cup in which a pint Mason fruit jar is imbedded in plaster of Paris. The plaster is kept wet with water, which keeps the air moist and prevents the glue from drying. The cone top, fitting tightly, prevents evaporation and also holds the stick or brush which is used to spread the glue, in an upright position. This glue can is inexpensive, easy to make and will be found a valuable addition to the shop equipment."



FIRE SET.

The fire set offers an interesting opportunity for work in forging. The set which is shown in the photograph is the work of pupils of Mr. E. H. Masters of South High School, Cleveland. No detail drawings or dimensions are given as the photograph itself will no doubt prove sufficiently suggestive.

LEVEL.

There is seldom a boy that does not take an interest in the work of a surveyor as he goes about using his transit. With the simple water level of Hans Schmidt of St. Paul, a number of the problems of the transit man can be worked out.

DISCUS.

The problem of finding small pieces suitable for pattern making upon the lathe is difficult, so this suggestion of the discus by S. O. Champion of Lakewood, Ohio, will be welcome. The boy, too, will appreciate this correlation of manual training with athletics.

SLEEVE BOARD.

The sleeve board will find its greatest use if it be provided with some sort of base. These two may be permanently fastened together or the board may be hinged to the base. According to Allison P. Ball of Worcester, Massachusetts, who has sent in the sketch, the hinged board seems to meet the needs of the mothers, than whom we have no better criterion.

CURRENT ITEMS

Clinton S. Van Deusen, Editor.

James A. McNeill Whistler, a collection of whose works Mr. Charles L. Freer has recently presented to our National Gallery, was one of the greatest artists and certainly the most original artistic genius whom America has produced, and yet he lived in this country for only fifteen years of his life, and those were the years of his youth.

He was once asked when he was coming back to America, and his reply was, "When the duty on art is removed."

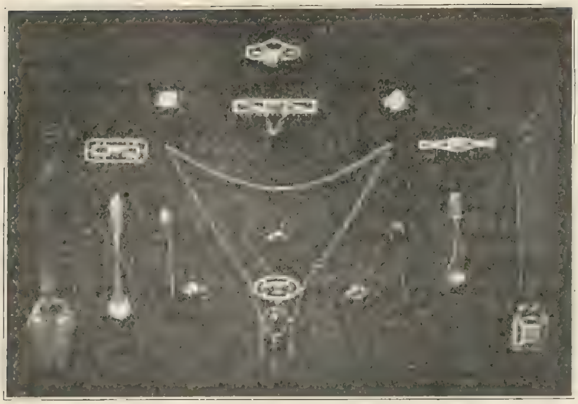
That a great nation should deliberately discourage the importation of beautiful things was to him a mystery, as it is to nearly every one else. What difference does it make whether objects of beauty come out of the East or out of the West, so long as they add to the happiness and refinement of the people?

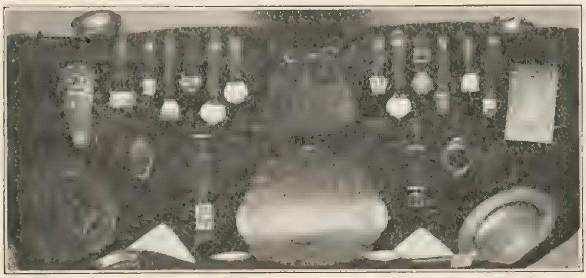
It is most remarkable that practically the only nation which discourages the importation of the beautiful happens to be the youngest and richest of all, and the one most in need of what it wilfully excludes. Happily, this mark of barbarism is soon to be erased by a Congress which is disposed to give the fine arts their proper place in the nation.

Manual training was started in Tampa, Fla., about a year ago, and is being well received by the community. Woodwork only is given at present, but forge and machine work will probably be introduced when the new high school is built. Many places in Florida are making a start in the work and the outlook for manual training in the state is bright.

The board of trustees of the Kentucky Normal and Industrial Institute, Frankfort, Ky., has provided fifteen new sets of carpenters' tools, and materials for fifteen new work benches (which the boys are making), and nearly or quite as much in the way of new equipment to the several other industrial departments of the school. A noteworthy change has also been made in the way of time devoted to the industries. Instead of the hour and a half formerly given to the work a day, each class will give an entire day each week to the industries, beginning with the spring term. It is hoped that in this way interest will be stimulated and greater results accomplished. This spring work is to be started on a new mechanical shop which will be about 50 x 125 feet, the first floor of it will be divided into two large rooms for work benches and woodworking machinery; the second floor will be for mechanical drawing and printing. There will probably be installed in the basement a 50 H. P. gasoline engine, in two units, for operating the woodworking machinery in the day and the electric light plant at night.

Oklahoma is moving along with rapid strides in the matter of industrial training. Agriculture, industrial training, and domestic science are required





WORK OF STUDENTS OF THE COLUMBUS ARTS-CRAFTS SCHOOL, COLUMBUS, OHIO. ALL THESE PIECES WERE MADE WITH VERY SIMPLE EQUIPMENT. SEE ALSO ILLUSTRATIONS ON PAGES 332, 335 AND 340.

by law to be taught in every school in the state. Besides the State Agricultural and Mechanical College at Stillwater, there are two secondary schools of agriculture and industrial training now in operation and three others provided for in a bill now before the Legislature. It is the intention to place one of these secondary schools in each Congressional district of the state. Manual training will be one of the chief features of these schools.

The Normal schools at Weatherford, Alva and Edmund, have strong departments in manual training and domestic science. One hundred thousand dolhave been appropriated for a new building at Weatherford, in which the manual training will occupy 7,000 square feet of floor space; an estimate of $3,500 is made for new equipment, to be the most modern and operated by electric motors. Two assistants will be added to the present teaching force which is under the direction of L. P. Whitcomb. The Alva Normal has also developed a strong department under Clark Woodward. Mr. Wilson, a graduate of this school, is in charge at the Edmund Normal. All three schools will have graduates this year who will supervise manual training or drawing in high schools of the state.

Supt. W. E. Striplin of Gadsden, Ala., is planning for a big bond issue for the schools of his city, out of which he expects to set apart about $10,000 for manual training equipment.

Birmingham High School at Birmingham, Ala., has just completed the installation of its manual training equipment, and now boasts of modern and complete shops in joinery, cabinet making, wood turning, pattern making, foundry, forge, machine shop, sewing, cooking, mechanical and free-hand drawing. The city has also just passed favorably on bonds for $350,000 for school purposes. Out of this, among other things, there will be another high school equipped with complete wood and metal shops similar to those of the present high school. With these two manual training high schools and a number of manual training and domestic science centers, Birmingham will occupy an enviable place among cities of her size in the manual training line. The work is in charge of R. L. Dimmitt and the following additions have recently been made to the force of manual art teachers of the city: Miss Maud Gibson of Oxford, Ohio; Mrs. Lenore Eldred of Romeo, Mich.; R. F. Jarvis, of Columbia, Mo., and Truman A. Thomas of Birmingham.

The annual exhibit of public school work in drawing and manual training is to be held at the University of Illinois May 20th to 22d, in connection with the annual oratorical and athletic contests. These exhibits are examined by competent judges and honorable mention awarded to all especially good examples of work. It is the thought of the University that the return of this commended work to the schools will serve as a stimulus to the students, and set standards which will improve the quality of future work.

Ernest A. Batchelder, writer on design and industrial problems, has recently returned from a trip through Europe, where he has spent six months studying the art schools. He attended the International Congress for the Promotion

of Art held in London and afterward visited Vienna, Budapest and other cities noted for their industrial schools. He is now in Minneapolis directing the classes in the Handicraft Guild School of Applied Design.

Denver now has thirty-three manual training centers; twenty-nine of these are equipped for woodworking and four for domestic science. For some fifteen years some of the districts in Denver have had manual training in the public schools in all the grades from the kindergarten through the high school. Since the consolidation of the districts, six years ago, every pupil in the public schools of Denver has had the opportunity of taking manual training during the entire time of his attendance. The work in the kindergarten and the first grade is under the supervision of Miss Margaret Giddings. The handwork in the first and second grades is done in connection with the drawing work under the regular grade teachers. From the first to the seventh grades inclusive, the girls are taught sewing by the regular grade teacher, under the supervision of Miss Ida B. McGlauflin. The eighth grade girls take domestic science under a special teacher at one of the four domestic science centers. From the third to the eighth grades inclusive, the boys take their manual training work under a special teacher in one of the shops. Their work consists of cardboard work, bookbinding, elementary bench work, furniture making, carving, freehand working sketches, mechanical drawing and designing. This work is done under the supervision of Milton Clauser. When a pupil enters high school, he has the choice of going to the Manual Training High School or to one of the other high schools. The demand for manual training has been so great that an annex to the Manual Training High School has been opened in the Longfellow School. Next year the entire building will be devoted to high school work. The first year's work will be done at the Longfellow building and the last three years' work, at the Manual Training High School.

The new Manual Arts building of the Washington School, Berkeley, Calif., is now ready for occupancy. The lower floor includes a woodworking room, thirty-four by forty-five feet, a teachers' office and lumber room. The cooking and sewing rooms are on the second floor. The policy pursued in Berkeley is to have a manual arts building for every large grammar school. In pursuance of this policy, six buildings have thus far been built.

Interest in manual training is increasing in the state of Idaho. At the Albion State Normal, where woodwork has been carried on for four years, efforts are being made to secure an appropriation to increase the equipment for the manual training and domestic arts departments. J. L. Stenquist came from Walla Walla, Wash., this year to take charge of the work.

The new Mayflower school building at Cleveland, practically completed, provides for a new manual training center for grammar grades, inncluding rooms for woodworking and domestic science. The equipments are nearly completed and the rooms are to be opened to classes following the spring vacation early in April.

REVIEWS

Elementary Forge Practice. By John Lord Bacon. Published by John Wiley & Sons, New York, 1908. 7½ x 5 in.; pp. x + 279; 335 figs.; price, cloth, $1.50 (6/6 net.)

This is a second and enlarged edition of one of the best texts in its class. The author, who is instructor in forge work at Lewis Institute, Chicago, understands thoroly the requirements of such a text and the success of the first edition shows that they have been met.

The table of contents includes: General description of forge and tools; Welding; Calculation of stock for bent shapes; Upsetting, drawing out and bending; Simple forge work; Steam-hammer work; Duplicate work; Manufacture of iron and steel; Tool-steel work; Tool forging and tempering; Miscellaneous work; Tables.

The book is fully illustrated and the drawings are well executed. Independent of the drawings which illustrate the text is a full set of working drawings for a standard course of exercises in forge work, including numerous supplementary problems. —W. T. B.

Social Education. By Colin Alexander Scott, Head of Department of Psychology, Boston Normal School. Published by Ginn & Co., New York, 1908. 7½ x 5 in.; xi + 300 pp.; price, cloth, list $1.25; by mail, $1.35.

This readable book, according to the prospectus, is "a handbook for teachers who think." "It is a plain and practical account of the life of the school from the standpoint of the social forces which are ever at work among pupils of all ages. It is not based upon mere ideals or philosophical abstractions but upon countless observations of schools of various kinds from the kindergarten up to the college grades. The book is full of the actual activities of living children, and its aim is to show how these can be made more productive, more ethical, and more happy and spontaneous. Three great schools are studied in detail, but most of the pages are given up to facts drawn from the average American grade school."

Chapter X on "The Manual Arts: Industrial and Constructive Work," and Chapter XI on "Fine Art," should be read by every worker in these lines, but especially those in whose schools "paradigms in joints are substituted for those in Latin."

Knowledge should be "experimented with and proved to be a power in gaining results acually wished for by the pupils themselves. For this kind of experimenting there is no better opportunity than is afforded in manual training and industrial work." —W. T. B.

Standards in Education. By Arthur Henry Chamberlain, Dean and Professor of Education, Throop Polytechnic Institute. Published by the American Book Co., New York. 7½x5½ in.; 265 pp.; price, $1.25.

This book is the result of an effort to provide a text book for students in education in normal and training schools and for private reading and study. It does not attempt to cover so broad a field as to bewilder and discourage the beginner, and the author admits that "he has to ask himself many of the questions herein asked the students." As Dr. Frank McMurray says, "Inasmuch as the author frequently presents the views of prominent authorities, in addition to his own, the book possesses the important advantage of real breadth of treatment."

Some of the chapter headings are: The aim of education; The elementary curriculum; The meaning of Correlation; Basis of ethical Training; Training, professional growth and recompense of the teacher.

The chapter on "Industrial Training: Its Aim and Scope," is one of the best presentations we have seen of the claims of this work to a place in the school.

The summary at the close of each chapter, with suggestive topics for further study, and selected bibliographies constitute valuable features of the work.

—W. T. B.

Handbook of Small Tools. By Eric Oberg, Associate Editor of *Machinery*. Published by John Wiley & Sons, New York, 1908. 8¼ x 5½ in.; ix + 517 pp.; 282 figs.; price, cloth, $3.00 (12/6 net.)

This is a comprehensive treatise on the design and construction of small cutting tools, such as threading tools, taps, dies, milling cutters, reamers, drills, counterbores, etc. It should prove a valuable reference book in any shop.

The author wishes to "emphasize the fact that the information given is authentic, and that the book places on record the most modern practice in tool manufacture, the experience gained by him during several years' connection with one of the foremost tool making firms in the country, the Pratt & Whitney Co., being the basis of the treatise."

The book is fully illustrated and well provided with formulas, tables of standard dimensions, etc. —W. T. B.

Essentials of Botany. By Joseph Young Bergen. Published by Ginn & Co., Boston, 1908. 7½ x 5 in.; ix + 380 pp.; 248 figs.; 14 pl.; price, cloth, list $1.20; by mail, $1.30.

This book is designed for use in secondary schools which devote a year to botany. It is based on the "Elements of Botany," by the same author, which has been subjected to revision and considerable expansion.

The many illustrations help to make an attractive book and the half tones are especially good. The recent tendency to make the study of botany useful receives recognition in the discussion of such topics as: Some useful plants, Plant breeding, Forestry, etc. —W. T. B.

Third International Art Congress for the Development of Drawing and Art Teaching and Their Application to Industries: London, 1908. The transactions of the Congress, edited by C. Myles Mathews. Published at the Office of the Congress, 151 Cannon St., E. C. 9¼ x 6 in.; 593 pp.; 8 pl. and several figs.; price, paper, 6/—.

Besides the proceedings and discussions the book contains: "Teaching Should Follow Development," by Ebenezer Cooke; "Methodical Teaching of Ornamental Drawing," by Rector H. Hana; "The Art Teacher: What May Be His Part in the Emotional Education of His Pupils," (in French), by M. Paul Steck; "Résumé of a Conversational Lecture on the Architecture of London," illustrated, by Professor Beresford Pite; "Drawing as an Aid in Teaching Other Manual Branches in the Elementary School," by Dr. James P. Haney, New York.

— W. T. B.

Wilson's Combined Works.—Building Construction, Carpentry and Joinery, etc.—By John Wilson; John Heywood, Deansgate & Ridgefield, 29 and 30, Shoe Lane, London, E. C. 6 x 10 in.; pp. 431; price, six shillings. The book contains well illustrated discussions of the following subjects: Scales, brickwork, masonry, timber, leadwork, slating, woodwork, iron work, geometry and its application, strength of beams, graphic statics, questions and answers on advanced building construction, etc.

The author has been chief lecturer for about thirty years in the building trades department of the Municipal School of Technology, Manchester, England. As would be expected from such an author the subjects are treated in great detail and deal with the problems as they would be met with in England. Of course such a thing as balloon framing as used in many of our modern houses is not considered.

This book would be valuable as a reference book in American manual training schools especially where considerable attention is given to building construction.

Building Details, Part Four.—Drawn and published by Frank M. Snyder, Architect, 2754 Broadway, N. Y., 1908. 16 x 22 in.; 10 plates; price, $1.85, postpaid.

This is the fourth of a series of portfolios undertaking to present a careful reproduction to accurate scale of some of the best examples of architect's working drawings. This number contains valuable drawings of such details as the drawing room windows and finish from the residence of Mrs. James Roosevelt, New York; the doors from corridor of the first gallery of the Symphony Hall, Boston; copper and terra cotta cornices from the Bronx Church House, New York; entrance, gateways, etc. These plates represent the work of some of the best of our leading architects, such as McKim, Mead and White, Ackerman and Ross, and others.

The different materials shown on the plates are clearly indicated by conventions, the dimensions are figured and explanatory notes are complete. In addition, each plate contains half tone reproduction from photograph showing the completed work.

These portfolios will save much valuable time in preparing drawings of similar work, and as examples of the latest and best practice it would be hard for the instructor in Architectural Drawing to find anything better.

Styles of Ornament.—By Alexander Speltz. Published by Bruno Nessling, 64 East 12th St., New York, 1908. 7 x 9¾ in.; pp. 656; 400 plates; price, $6.70.

This is a very complete reference work on the history of art and styles of ornament. The book is divided into three parts: Part One—Antiquity, dealing with Pre-Historic, Egyptian, Babylonian, Grecian, Roman, and other styles of ornament; the Middle Ages, iincluding Byzantine, Roman, Islam, Gothic, Chinese, Japanese, etc.; and Modern Times, including the Renaissance, Barocco, Rococo, and Colonial styles.

The ground is so thoroughly covered and the illustrations are so numerous and well selected that this is sure to prove a valuable reference work for students and teachers. Comprehensive indexes add to the usefulness of the work.

The Up-to-Date Home: Money and Labor Saving Appliances.—Bulletin of the American School of Economics, published quarterly; 606 W. 69th St., Chicago, 1908. 5¼ x 7½ in.; pp. 48; price, ten cents.

This is a bulletin prepared especially for members of the American School of Home Economics to describe a few of most useful household appliances recently put on the market.. The point of view is that of the comfortable American home supplied with modern plumbing, heating and lighting systems, etc. Household appliances have been invented in nearly all cases by men to sell. Many of them are worse than useless but more are excellent in their right places. As time goes on family living will use more and more labor saving household appliances. This bulletin is designed to direct attention to a few of the best of these that are likely to be practically useful in the average home.

Some of the topics discussed are fireless cookers, steam cookers, efficiency in heating water by gas, alcohol as fuel, electric cooking, dishwashing machines, laundry equipment, etc.

The bulletin also contains a short bibliography.

The following have been received:

Circular of Information.—Bulletin No. 7, November, 1908; issued by the National Society for the Promotion of Industrial Education. Officers, members, purposes of the Society, and Constitution. Dr. James P. Haney, Secretary, 546 Fifth Avenue, New York, N. Y.

Education of Workers in the Shoe Industry.—Bulletin No. 8, December, 1908; issued by the National Society for the Promotion of Industrial Education. This preliminary study was prepared by Arthur D. Dean, Secretary of the Sub-Committee on Education of Workers in the Shoe Industry, associated with George E. Keith, President, Keith Shoe Co., Brockton, Mass., and John P. Meade, Business Agent, Boot and Shoe Workers' Union, Brockton.

Child Study in Relation to Elementary Art Education.—By Earl Barnes. Reprint from "Art Education in the Public Schools of the United States." Published by the American Committee of the Third International Congress for the Development of Drawing and Art Teaching, by the American Art Annual, 546 Fifth Avenue, New York, N. Y.

Labor Legislation Pending in Congress.—By James A. Emery, general counsel, National Council for Industrial Defense. Reprint from "American Industries," magazine of the National Association of Manufacturers, 170 Broadway, N. Y.

Industrial and Trade Schools.—A pamphlet containing two addresses by Dr. Andrew S. Draper, Commissioner of Education. Published by the New York State Education Department, Albany. The subjects are: "Our Children, Our Schools, and Our Industries;" and "The Adaptation of the Schools to Industry and Efficiency."

Stout Institute Bulletin, Vol. III, No. 4. Contains outlines of courses of study, announcement of Summer Session, and two papers, "Problems of Organization," and "Problems of Supervision.". Address L. D. Harvey, President, Stout Institute, Menomonie, Wis.

Prospectus of the Milwaukee School of Trades, 156-158 Clinton St., Milwaukee, Wis. A neat pamphlet containing half tone illustrations of the various shops, lists of equipment, a statement of the purposes of the school and information with reference to courses of study.

The Arts-Crafts School of the Wiliam Morris Society. A circular of information concerning the work of the Arts-Crafts School located at 199½ South High St., Columbus, Ohio.

Industrial Education with Especial Reference to the High School.—An address by Eugene Davenport, Dean of the College of Agriculture, University of Illinois, Urbana.

Manual Training.—The Journal of the National Association of Manual Training Teachers of England. Published monthly by the Association, Lindum, Spencer Park, St. Albans. The series of biographical sketches, illustrated by photographs, entitled "Makers of Manual Training," which was begun last year is still running. The subjects this year have been: J. H. Judd, Supt. of Handicraft, Manchester; Richard Wake, Secretary to the Wicklow County Joint Technical Committee.

There has also appeared an interesting series of Examination Questions for Teachers of Shopwork and Drawing, a set of questions being printed one month and the answers the following month.

CLEVELAND PUBLIC SCHOOLS—SEVENTH GRADE PROBLEM IN PICTURE FRAMING.

VOLUME X. NUMBER 5.

MANUAL TRAINING MAGAZINE

JUNE, 1909

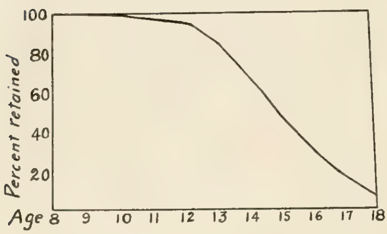
A STUDY OF SOME MANUAL TRAINING HIGH SCHOOLS WITH SUGGESTIONS FOR AN INTERMEDIATE INDUSTRIAL SCHOOL.

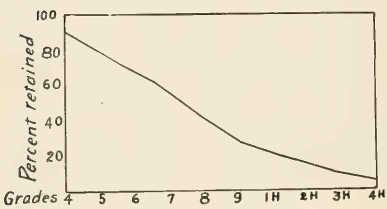
ROBERT W. SELVIDGE.

IN any discussion of our public school system to-day two significant facts are usually pointed out: first, the rapid elimination of pupils from our schools, beginning about the twelfth or thirteenth year of age; second, the failure of the school to prepare the child to enter an industrial pursuit in which there is an opportunity to advance to a skilled occupation. It is generally believed, and a somewhat extensive investigation tends to show, that these facts are intimately related; and that one may be, to a considerable degree, the cause of the other.

Professor Thorndike in his study, "The Elimination of Pupils from School," finds that "practically no pupils drop out before 12 years of age, but that of 100 in school at 8, 9 leave while only 12 years old, 18 while 13 years old, 23 while 14, 17 while 15, 13 or 14 while 16, and 8 while 17." It thus appears that the elimination is greatest at the ages of 14 and 15. He also finds that the elimination by grades is practically uniform from the fourth grade on. It is further found that 68 percent of those in the second grade stay until the sixth grade, 97 percent of the 8-year-olds remain until 12, while 70 percent of the 8-year-olds remain until they are 14. These percentages are based on those entering the second grade and are lower than they would be if based on the number of pupils beginning school.

The accompanying diagrams, taken from Professor Thorndike's study, show the elimination with respect to age and with respect to grade:





From a study of these diagrams it appears that, for the boy of 14, the school needs to greatly increase its holding power, in order to overcome the increasing attractiveness of outside life.

The second proposition usually takes the form of a rather severe indictment of our public school curriculum. The school work is so remote from the industrial life in which the boy is interested, and in which he must soon engage, that he is unable to see any relation between them. He feels the need of something on which he can realize in the near future. He wants something that will increase his efficiency and earning capacity. Failing to get this, he leaves the school, and goes to fill the ranks of unskilled labor.

The manual training high school is an excellent institution, in its field, but it has contributed little to the solution of these problems. Quite contrary to the general opinion, it does not appear to hold pupils as well as the other high schools. In Professor Thorndike's monograph, above referred to, page 28, he gives the result of his examination of the high schools in forty-nine cities. This table is based on the enrollment by classes for a given year. Consequently it does not represent accurately the amount of elimination, because it does not take into account the growth of the school. However, it affords a fair basis for comparison of similar facts gathered from manual training schools. This table is worked out for the sexes separately. The median ratios of the second, third and fourth years to the first year are:

Boys, 2/1 = .66; 3/1 = .39; 4/1 = .25.

Girls, 2/1 = .70; 3/1 = .45; 4/1 = .31.

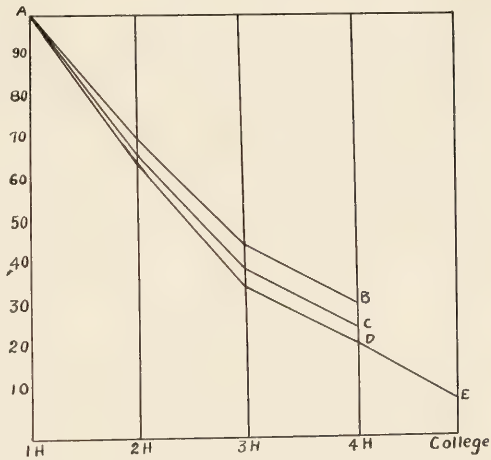
2/1 = second year's enrollment divided by the first; similarly, for 3/1 and 4/1.

That is, for 100 boys in school the first year there are 66 the second, 39 in the third and 25 in the fourth.

On pages 376 and 377 are given tables showing the enrollment by classes in sixteen manual training and technical high schools, or schools of that grade. These particular schools were chosen as being among the very best schools of their kind in the United States. The first table shows enrollment by years, also the percent of those entering the first year who remain through each of the succeeding years. In the last column is shown the percent of the graduating classes, estimated by the principal, who enter higher institutions of learning. The second table shows the ratio of enrollment in the second, third and fourth years to the first, in each of the schools.

This chart shows the elimination by years, for girls and boys taken separately, in the regular high schools; and for boys and girls taken together in the manual training high schools.

A B shows the elimination of girls from the regular high school; A C shows the elimination of boys from the regular high school; (Thorndike); A D shows the elimination of boys and girls from the manual training high school; and A E shows the elimination of boys and girls from the high school to college entrance.



It should be noted that a majority of these manual training schools are co-educational and that girls usually are retained to a greater extent than boys. This being the case, it appears that the elimination of boys in the manual training high school is considerably greater than it is in the ordinary high school. Some of these sixteen schools are growing very rapidly, but the same might be said of the schools in the list of forty-nine cities with which the comparison is made. The Stuyvesant High School has been pointed out as one which certainly should be left out of this list on account of its being a new school. I was inclined to think the objection to this particular school well taken, but on further investigation I found that the graduating class of 32, last year, represented 18

ENROLLMENT BY YEARS.[1]

Name of School and City	First Year	Second Year	Third Year	Fourth Year	Per cent of Graduates Attending Higher Schools Estimated by Principal
Manual Training, Kansas City, Mo.	680	433	291	243	25%
Manual Training, Indianapolis, Ind.	696	498	285	181	30%
Crane Manual Training, Chicago, Ill.	498	272	218	112	40%
McKinley High School, St. Louis, Mo.	604	433	263	176	33%
Polytechnic Institute, Baltimore, Md.	297	194	97	67	30%
McKinley High School, Washington, D .C.	333	168	88	73	36%
Cogswell Polytechnic, San Francisco, Cal.	84	68	36	20	25%
Stout Manual Training, Menomonie, Wis.	83	64	57	44	50%
Manual Training, Denver, Colo.	400	300	109	70	45%
Mechanic Arts, St. Paul, Minn.	320	176	78	46	50%
Stuyvesant High School, New York City	541	236	112	65	84%
Manual Training, Brooklyn, N. Y.	1721	816	338	177	36%
Mechanic Arts, Boston, Mass.	288	216	161	65	....
Boardman High School, New Haven, Conn.	204	114	73	47	....
Rindge High School, Cambridge, Mass.	207	180	92	65	....
Technical High School, Springfield, Mass.	356	235	121	65	....
Total	7312	4403	2419	1516	
Percentage of those *entering* the first year who remain through each of the succeeding years	....	60%	33%	20%	8%

[1] For 1907-8

Ratio of Enrollment in the Second, Third and Fourth Years to the First, in Each of the Schools:

(2/1 = second year's enrollment divided by the first; similarly, for 3/1 and 4/1.)

Name of School and City	$\frac{2}{1}$	$\frac{3}{1}$	$\frac{4}{1}$
Manual Training, Kansas City, Mo.	.636	.427	.357
Manual Training, Indianapolis, Ind.	.715	.409	.260
Crane Manual Training, Chicago, Ill.	.548	.437	.225
McKinley High School, St. Louis, Mo.	.716	.435	.291
Polytechnic Institute, Baltimore, Md.	.653	.326	.225
McKinley High School, Washington, D. C.	.504	.264	.219
Cogswell Polytechnic, San Francisco, Cal.	.809	.428	.238
Stout Manual Training, Menomonie, Wis.	.771	.686	.530
Manual Training, Denver, Colo.	.750	.272	.175
Mechanic Arts, St. Paul, Minn.	.550	.240	.143
Stuyvesant High School, New York City	.428	.203	.118
Manual Training, Brooklyn, N. Y.	.474	.196	.102
Mechanic Arts, Boston, Mass.	.750	.559	.225
Boardman High School, New Haven, Conn.	.558	.357	.230
Rindge High School, Cambridge, Mass.	.869	.444	.314
Technical High School, Springfield, Mass.	.660	.339	.182
Medians	.65	.35	.22

percent of the original class. This makes a difference of approximately 6 percent when compared with the results shown in the table. The percent based on normal growth would lie somewhere between these two. The percent of those attending higher institutions of learning also is worthy of note. This is, in most cases, only an estimate by the principal, but the cases based on accurate records are among the highest of the list.

While the data here given is somewhat meager there is such a uniformity of points below Professor Thorndike's medians in each year that I am inclined to think the figures would not be greatly changed were a much larger number of cases examined. At any rate, it is pretty conclusively shown that the manual training school does not solve the problem of elimination.

The manual training high school fails to prepare its students for an industrial career in the skilled trades because it fails to reach the boys who enter such trades. The boy who completes the high school rarely cares to enter the shop as an ordinary mechanic. If he remains in school and conforms to the exacting requirements of a four-year manual training high school course, he probably has his ambition set on something higher than being a skilled workman. He has been, in a way, educated away from the shop. Mr. James F. McElroy, president of The Consolidated Car Heating Co., says that "a close investigation of the manufacturing industries of Albany, N. Y., shows that out of all the men employed in the mechanical departments less than 1 percent ever attended high school, and only about 7 percent had completed the course in the grammar schools."

Although I am without available material showing the reasons for the failure of the manual training high school in these two lines, personal observation and a limited investigation lead me to offer the following suggestions as possible reasons:

The boys who elect to attend manual training schools are of two classes, those who attend in the hope that it will in some way prepare them to enter the skilled trades, and those who hope to go to a higher technical school. That the latter class forms a large portion of those who remain is evidenced by the large percent of the graduating classes attending higher institutions of learning. As to the other class, who desire to enter the skilled trades, it is probable that the economic pressure is somewhat greater on them than on those who expect to take the engineering course. However, in my judgment, based on several years

of experience, the greatest force tending toward withdrawal is a disappointment in the course of study. It is difficult for the boy who wishes to become a machinist to understand why he should take a year of bench work in wood, a year in wood-turning and pattern-making, and a year in forging before he is allowed to go into the machine shop. It may be possible to convince him that that is the proper way to do it in school, and he may try it for a time; but it does not take him long to discover that, whatever may be the theory, the work has little practical value for him. He soon concludes that it is better for him to get out of school, where they do things in such proper ways, and go where he can begin work at once in some gainful occupation.

The manual training high school is an adaptation of the Russian idea of technical education to American conditions. Professor Charles A. Bennett, editor of the Manual Training Magazine, says of the Russian system: "What is known as the Russian system of manual training was not originally designed as a system of manual training at all, using that term in its best sense, but simply a means of teaching the mechanic arts to students of engineering. Strictly speaking it became a system of manual training only when Dr. Runkle, Dr. Woodward, and others adapted it to American school conditions and made it a part of the scheme of general instead of technical education." (Art Education, February-July, 1896.) Since the above was written, thirteen years ago, we have witnessed a tremendous development in the manual training schools and with it has come a corresponding change in our conception of their function. However, the general arrangement of the shop work remains essentially the same as in the interpretation of the Russian system given us by Dr. Woodward in his famous St. Louis Manual Training School. We have, to some degree, grown away from the system of joints and exercises but we still follow the general plan. In the St. Louis school Dr. Woodward had bench work, pattern-making and molding, forging, and machine-shop work. In all the schools here considered, with a single exception, the same sequence of work is followed in the regular course. In the exception the pattern-making and forge-work are transposed. Dr. Woodward divided his day of six hours into three equal periods; one given to academic work, one to drawing, and one to shop work. He thus gave ten hours a week to academic work, ten hours to drawing, and ten hours to shop work. We have departed somewhat from that division of time, but it has been in the direction of giving more time to academic work and less to drawing and

shop work. In this list of schools the average time per week given to academic work is 11 hours and 15 minutes, to drawing 3 hours and 20 minutes, and to the shop-work 5 hours and 30 minutes. The apprentice spends as much time in the shop in three weeks as the high school boy does in a year. The instruction the high school boy receives, for a given number of hours, is no doubt quite superior to that received by the apprentice in the same time, but the high school boy does not get enough of it.

This must not be construed as an attack on the manual training high school. Such schools have important functions to perform and are performing them fairly well, at least as well as the other high schools are performing their functions. Both are essentially preparatory schools and schools of general culture. As such they are quite successful with those who remain the four years. But, with all their excellence as preparatory schools and schools of general culture, both fail to keep the boy in school, and both fail to help materially the boys who are to engage in the skilled and mechanical industries as journeymen.

If any solution of these problems is to be found, it must be in the arrangement of a curriculum that will prepare the boy for his industrial career just as the high school prepares for the college and future professional career. The trade school for the boy before he has reached the age of 16 is of doubtful value. Few boys, before they have reached that age, are sufficiently developed physically to engage in the mechanical or building trades, even as apprentices. Aside from this, they are wanting in the sense of responsibility and judgment which makes them desirable in the skilled trades. We must give them something that will be a distinct advantage to them when they enter their trades. We must cultivate in them resourcefulness, adaptability and mechanical ingenuity. On the degree to which they possess these abilities will depend largely their success in the manufacturing and mechanical industries.

In formulating the following course of study I have kept in mind this question: "What shall we teach a boy who has completed the sixth grade, is 14 years old, and who must begin to earn his living when he is 16?" The boy is required to be 14 because he is usually not strong enough, physically, to take up his regular trade work before he is 16. The completion of the sixth grade is required because it is believed that, except in special cases, all boys can reach the sixth grade by the time they are 14. For special cases, special provision must be made.

The nature of the academic work has been determined largely by personal experience as an apprentice and as a skilled workman, illuminated by the experience of several years in teaching the mechanic arts. I have tried to include, not only those things of direct vocational value to the mechanic, but something of the things which give him his pleasure and his inspiration. The history is intended to give a view of industrial progress and emphasize the responsibilities of the individual as a member of society.

The nature of the shop work has been determined by what is conceived to be the demands of industrial life, and not by a traditional school course. Modern production is machine production. The machine is the prime element in industrial life. With the exception of the building trades, practically all skilled machanics must be able to use a machine. Since a knowledge of machines is the most general need of the worker to-day, our course in shop work should be based on that need. Shop work that takes the form of what is known as "craft work" is a good thing as a matter of culture, just as music and drawing, and as such should be encouraged, but industrially it is reactionary. We do not live in the stage of handicraft production, nor can we return to it. The machine is our tool, and if we are to be efficient workers we must become acquainted with its characteristics and the principles on which it is constructed. It will be noted that in the plan of shop work here proposed relatively little time is given to the making of things. Although it is not intended to dispense with such exercises as are necessary to familiarize the boy with the various machine and hand tools, it is believed that he will be more interested in making "a skilled mechanic" than in making "exercises."

The course covers two years and the general plan of pursuing it is as follows:

1. An eight hour day.
2. No home work.
3. Recitations should be for the purpose of instruction and training in methods of study rather than for quizzing.
4. Unify the work to as great a degree as possible.
5. Keep to the definite aim of helping the boy become thoroughly familiar with that body of general knowledge which distinguishes the alert, intelligent and skilled workman from the mere machine tender.

Subjects and Time Apportionment.

The recitation periods are to be 40 minutes. The following is the time, in minutes per week, to be given to each subject:

FIRST YEAR		SECOND YEAR	
English	200	English	200
History	200	History	200
Mathematics	200	Mathematics	200
Materials and Sources	200	....	
Physical Science	240	Physical Science	280
Mechanical Drawing	240	Mechanical Drawing	280
Shop Work	720	Shop Work	840
Total	2,000	Total	2,000

Outline of Subject Matter.

ENGLISH.

First year.—Teach letter writing and business forms, bills, notes, checks and drafts with instruction in common business practices. In this work use actual business forms. Write and answer advertisements. The composition work should be devoted chiefly to the description of processes and the things with which the student comes in frequent contact. Illustrations, by means of sketches, should accompany the description. Our technical magazines furnish excellent examples of this kind of composition. The object is to give the boy power to describe a machine or a process with clearness and accuracy.

In literature read for appreciation, not dissection. Intend to cultivate a love for reading. Take some story, such as "The Call of the Wild," "Silas Marner," or "Rip Van Winkle," and read it with the class. Aim to stimulate feeling. Point out the things to be noted in reading and show how to read and discuss a book. After this introductory work submit a considerable list of books and let each boy select one for reading, having him report to the class on the principal features of the book read. Do not be too Puritanical in the selection of books for the class. A few books dealing directly with industrial and social questions should find a place in the list. Try to teach the boys how to find pleasure in careful, intelligent reading. The reading should be alternated with the formal work.

Second year.—Continue along the same lines as in the first year. When the boys become thoroughly familiar with any phase of the formal work it should be dropped and the time given to reading. Review the formal work frequently in order to keep it well in hand. The descriptive composition work should be kept up.

HISTORY.

First year.—Teach the industrial history of the United States. This should depict the economic and industrial life of the Colonies and show the economic background of the various important movements in our history. Study the effects of the vast areas of free land, frontier life, enormous supply of raw material, inventions, improvements in transportation, the factory system of production, and the concentration of population.

Second year.—Study the mechanism of our government and show how it has changed in spirit, if not in form, in an effort to meet the needs of a changed industrial order. Make a brief study of the industrial revolution in England as showing a transition from the handicraft stage of production to the factory stage. Follow this with a study of trade ethics and a history of the labor movement. Emphasize the individual responsibility for social welfare.

MATHEMATICS.

First year.—Drill thoroughly in the fundamental operations, common fractions and decimals. Emphasize accuracy and methods of checking work, such as making a rough estimate of the result before computation is begun. Special attention should be given to methods of attacking problems. Teach percentage with its application to practical industrial problems, discount and interest. Take up accounts, bills, and commercial problems in connection with the business forms in English. Teach mensuration, and give review work in weights and measures, both English and Metric. The source of the problems should be the laboratory and the shop, supplemented by problems from outside industrial life. Ratio, proportion and variation should be taught, with application to concrete industrial processes. Give work in approximate numbers, methods of approximations, allowances made in practice, shop rules and methods of computation. Teach the use of the slide rule with methods of obtaining powers and roots. Teach the use of the graph and the graphical solution of shop problems.

Second year.—Teach the meaning of formulas and how to evaluate them; the simple equation; positive and negative numbers; fundamental principles of exponents; logarithms and the use of tables.

Teach constructive and inventional geometry in which there should be relatively little demonstration. Give special attention to the development of surfaces and the intersection of solids with special reference to the graphical solution of problems. Problems involving proportion, similar figures, the sum of all the angles of a triangle and the Pythagorean theorem are of the most frequent occurrence in practical work and so should receive a large amount of time.

MATERIALS AND SOURCES.

First year.—The work in materials and sources should be very largely the outgrowth of the shop work. It should deal with the sources of supply of our principal raw materials, the extent to which they are used in industry, and the nature and limitation of these materials for modern industrial purposes.

Wood should be studied with regard to its structure and properties, weight, strength, durability, extent of use in industries, displacement by metal, forest areas and their location, lumbering and forest preservation. Study iron and steel as to methods of production, factors determining the location of the industry, means of transportation, markets and the increasing importance of iron and steel as structural materials. In a similar manner study cement, oil, coal, copper, zinc, cotton, wool and linen.

MECHANICAL DRAWING.

First year.—Make simple working drawings from objects and from freehand sketches, involving the use of instruments, lettering, dimensions, dimension lines and ink work. Make freehand sketches to illustrate the composition work. Make freehand sketches from working drawings. Use the outline of type solids in making these sketches. From sketches of machine parts make working drawings. Use isometric and co-ordinate paper for making sketches. Make drawings of some simple cams found in the machine shop. From formulas make drawings of nuts, bolts, threads and keyways. Give thorough drill in reading and checking working drawings.

Second year.—Draw developments and intersections in connection with the shop work and geometry. Make sketches of the parts of the various mechanical movements studied in the shop, and from these make

working drawings. Study the effect of modification of these parts. Make assembly drawings of the machines from the drawings of their parts. The making of tracings and blue prints should be carried on throughout the work. Great care should be taken to cultivate habits of neatness, accuracy and dispatch.

PHYSICAL SCIENCE.

First year.—This work should be the outgrowth of the work in the shop and the familiar facts of industrial life. The shop will form the best laboratory. No attempt should be made to secure the complete mastery of a topic before another is taken up. The shop work will furnish abundant opportunity to return to the various topics. Opposite the topics given below are set the forms of industrial work through which the subject may be best studied.

Properties of Matter: Study of Materials.

Force: Measuring, weighing, etc.

Liquids and Gases: Pumps, siphons, jacks, hydrostatic presses, tanks, steam steam engines, etc.

Dynamics: Braces, trusses, framework and levers.

Machines: The various types found in the shop.

Heat: Thermometers, conduction, convection, radiation, heating plants, smelting, vaporization, steam boiler, evaporation, expansion, and ice plants.

Light: Lenses, photography.

Second year.—The general method of presentation in the second year should be the same as in the first year.

Combustion: Rust, explosion, oxidizing flame, principles of flues, chimneys and grates, smoke consumers, destructive distillation, and the manufacture of gas.

Sound: Bells, whistles, telephones, and musical instruments.

Electricity: Magnets, electro-magnets, electric cranes, plating, bells, telephones, telegraph cells, dynamos and motors.

SHOP WORK.

First year.—The course in shop work should involve the use of wood and metals in problems of construction. The nature of these materials should be studied and their uses and limitations in construction considered. This should be done in connection with the course in materials and sources. Let the problems center about industrial activities. This work should be sufficient to familiarize the student with the principal hand tools and to enable him to use them with some degree of skill.

Study machines for the purpose of analyzing them and finding out how they work and why they work. The wood turning lathe is a good type of machine to study first. Take up the application of power, methods of changing speed, and methods of calculating speed. Note the essential characteristics of the machine—a revolving spindle which moves the material while we apply the tool. Consider the historical development of the lathe and show cuts of early types. Have the students select other simple, spindle machines and make a comparative study as to application of power and manner of doing the work. Study these machines in detail. Have them taken apart and assembled until the students are thoroughly familiar with the functions and relations of the various parts. These parts should be sketched to form the basis of the work in drawing.

The student should do enough work on the machine to become familiar with the methods of operating them and know definitely their limitations and possibilities. It is not intended to make the student an efficient machine operator on any particular machine; but rather to give a knowledge of the common elements found in all machines with a view of increasing his resourcefulness and adaptability.

Take up the study of machines where the spindle has been so modified that some additional motion is conveyed. The drill press is a good example of this kind of a machine. Study carefully the modifications in the drill press, how they are applied and what they are designed to do. Seek for similar modifications of the spindle in other machines and the functions which such modifications are intended to perform. Extend this comparative study as far as possible. These machines should be studied in the same manner as the simple spindle machines. Avoid machines with many modifications.

Second year.—Study carefully the principles of the automatic machines. Trace out the different lines which the power takes from the point of application to the point of doing the work. For example, show on the drill press how, from the primary spindle, the power is divided into two lines which unite again in revolving the drill and feeding it into the work. A slightly different example is found in the shaper where power is taken from the primary spindle to drive the tool, and another line to feed the work. Compare with similar modifications in other machines. Study methods of taking power off of the primary spindle, as by cams, belts, gears, etc.

Submit a machine of an old type, stating definitely what you wish it to do, and ask the boys to work out plans for the improvement. After their plans have been submitted and discussed show them how other men have worked out the improvement.

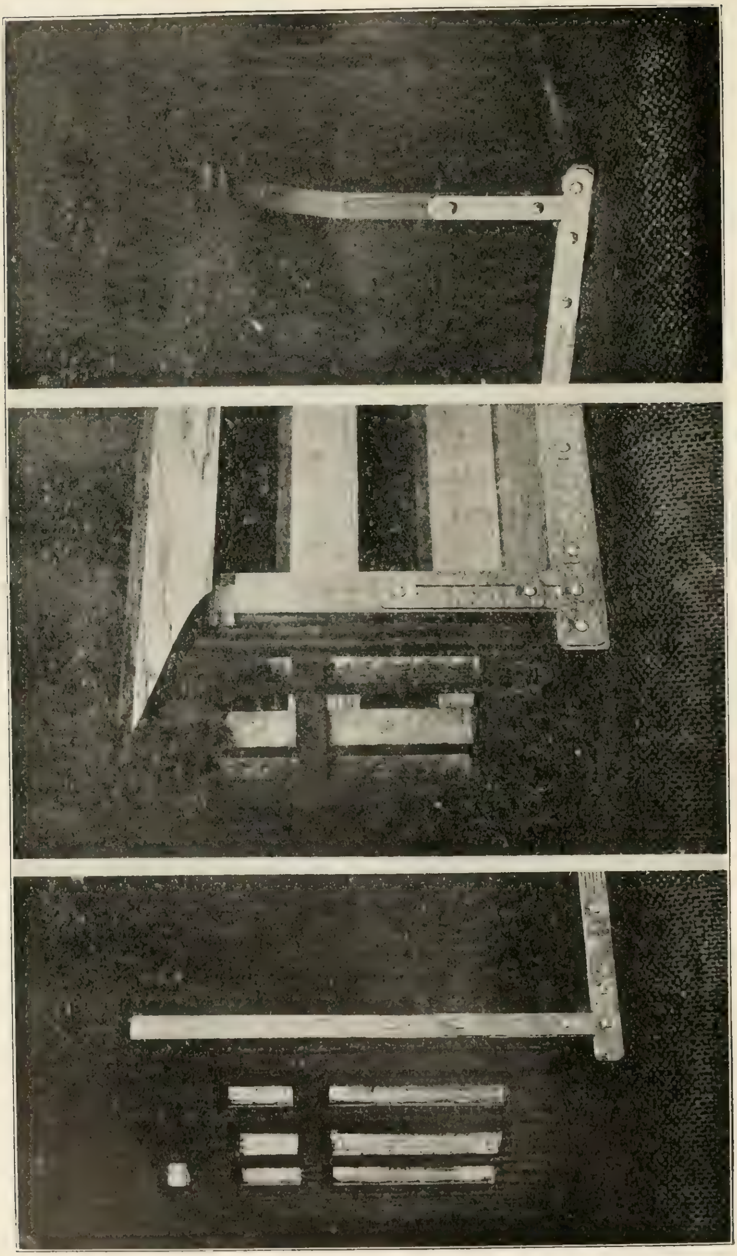
Take up machines in which there are a number of subdivisions of the channels through which the power is conveyed. The planer, milling machine, printing press, sewing machine and many others furnish good examples of this kind of machines. Study as great a variety as possible, seeking the common elements in all, and the methods of modifying and arranging the parts so as to make the machine do a specific thing. Give much attention to methods of locating trouble in a machine.

Study the steam engine and the gas engine by this method. So studied they become quite simple.

Throughout the course patterns of machine parts should be made, cast, and the parts finished. Forges should be available for occasional forge work.

Work shop methods and practices must be emphasized.

ARTS CRAFTS—COLUMBUS, OHIO.



BOOK RACKS WITH METAL ATTACHMENTS.

BOOK RACKS WITH METAL ATTACHMENTS.

Augustus F. Rose.

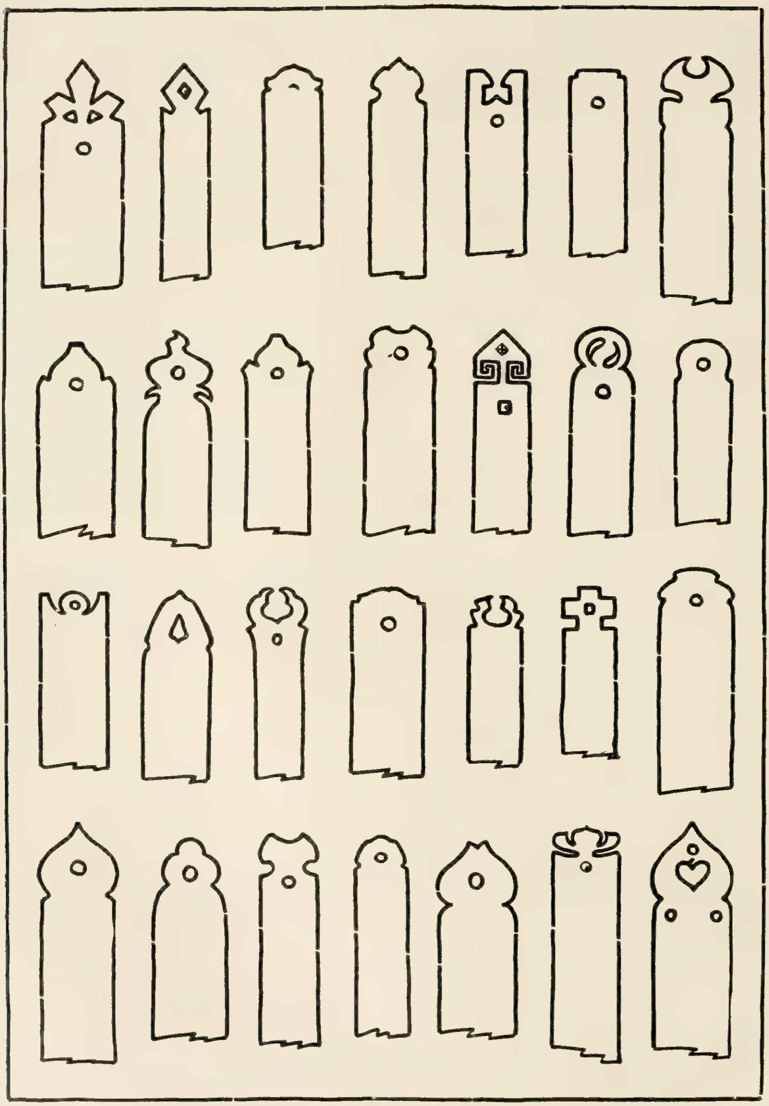
FOR a manual training model to be satisfactory it is not necessary that it be large; to attempt furniture construction in the form of chairs, bookcases or tables is not always wise; on the whole it is the smaller models that are most successfully used. The book rack model is one that has been especially satisfactory both from the teachers' and the pupils' standpoint. Only a small amount of stock is required, but a book rack well made from a carefully thought-out design is a thing a boy will prize more and more as he grows older, for it is something that he makes use of.

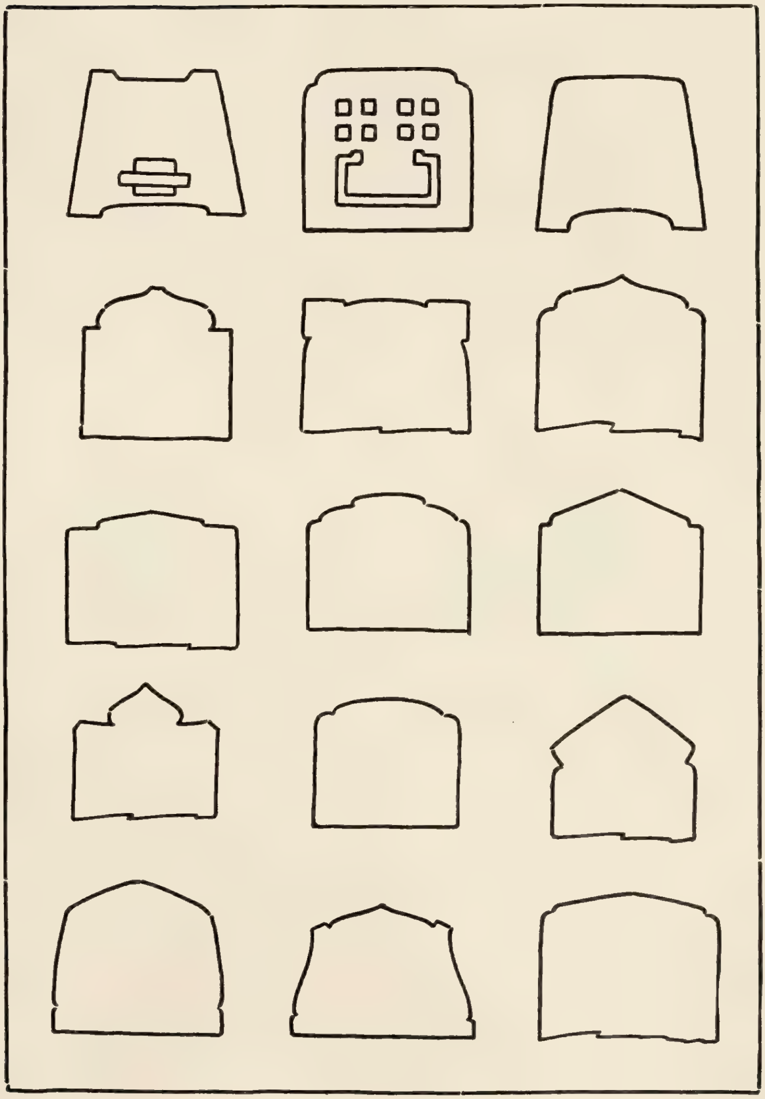
Although the book rack may be constructed in several different ways, the general idea is to have two ends or uprights that serve as supports for books. The uprights may be fastened to the opposite ends of a base that is a fixed length or to one that is adjustable; or the book rack may be made to hold any number of books if the uprights are fastened to a base only long enough to support them and are not joined in any way.

These uprights must be securely joined to the base if they are in the least degree to serve their purpose. The joint may be dovetailed or mortised and tenoned, or the base may be gained to receive the upright or end. By whatever method the joining is done, any device or attachment that may be applied which will tend to strengthen the joint and not detract from the appearance of the end should be made use of. Sometimes it is strengthened by the use of a pin when the joint is mortised and tenoned or, if the base extends beyond the end, a small bracket is often used.

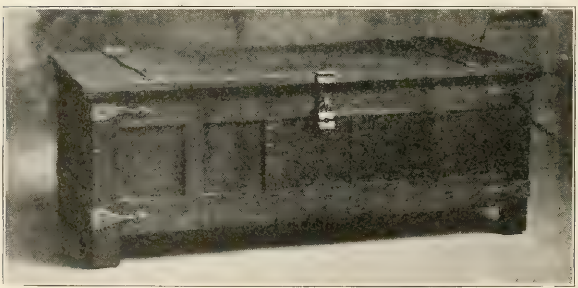
Another method of strengthening the joint and adding interest at the same time is to apply plates made of copper or brass. These plates should be designed so as to be in keeping with the decoration or outline of the upright. This seems to be a legitimate application of a little metal work to such an object and not only makes it of more real worth to the boy, but it gives him a little experience in another material and tends to hold his interest through the making.

The best thickness of metal to use in making the plates is 18 or 20 gauge. The same process is followed in making them that is followed in making an escutcheon. A tracing is made from the design and glued to the metal. The cutting is done either with a metal saw or a pair of





shears. Great care must be taken to have all edges perfectly smooth either by filing or by using emery cloth. Holes are then drilled in the plate where the rivets are to be placed; a No. 64 drill is large enough for most cases. If a drill is not at hand, the plates may be placed over a block of lead and the holes punched, using an ordinary nail set as a punch. For rivets or nails to hold the plates in place, use ⅝″ or ¾″ oval head copper tacks. The head of the tacks may be larger than is necessary, but a little filing will give it any desired shape. Before fastening the plates in place they may be colored or toned down to harmonize with the finish of the wood.



MADE BY STUDENTS IN PUBLIC SCHOOLS,
GREELY, COLO.

MANUFACTURERS' OPINION AS TO THE QUALITIES NEEDED IN BOYS WHOM THEY WISH TO EMPLOY, AND SOME COMMENTS ON HOW TO DEVELOP THESE QUALITIES THROUGH THE SLOYD METHOD.[1]

By Gustaf Larsson.

INDUSTRIAL education seems to be the burning question of to-day. Judging from the many meetings and reports on the subject, there has never been a time when the interest has been so general as during the last year. The reason for this is, no doubt, that the idea of a vocational training for our growing generation naturally appeals more to the great mass of the people than the more formal avocational training which the schools are giving.

It is true that schools are in many ways defective and that improvement might be made, but it is a very serious problem to know what the changes shall be. Laymen, or those outside of the educational field, are often ready with criticism and absurd suggestions as to improvements. The remark is frequently heard that "Children learn everything now-a-days except what they need, on leaving school." This is certainly a serious charge, if true. It is true that knowledge has sometimes been presented in such an abstract way that the children have not been able to grasp and apply it, and it has not given them real power. The result is not only a waste of valuable time, but what is worse, the killing of interest, of effort and of ambition in the pupil. All this might have been avoided and the child helped, instead of hindered, if the subject matter had been wisely chosen and so presented as to wake up the whole boy.

When change or advance is to be made in school methods we generally depend upon scientific educators for assistance. This, I believe, is the only safe course to pursue. In fact, I am sure that any question, be it social, political or industrial, can be settled satisfactorily only when it is considered from a truly educational point of view; that is to say, with the aim of developing general power and so securing the usefulness and happiness of mankind.

[1] Abstract of talk given before the Boston Manual Training Club, Mar. 27, 1909.

The solution of the question of school education is sometimes found in making the work more "practical," as they say, or more closely related to a child's future vocational calling, and in giving him while still in school such limited technical training as will prepare him directly to be a bread-winner. While I admit this is in many cases very important, it is of still greater importance that during the most plastic period of life, the school age, the cultivation of general power and a high standard which will be shown in all kinds of work should be first considered. It will be found that the ablest bread-winner, the one who can hold his place and climb higher, is the one who has had this general cultivation of head and heart and hand.

Although manufacturers and business men are not always the people to arrange school plans and methods, still, as they employ a large proportion of the young people just out of school, their report on the material that comes to them is of great value and must be helpful in our work. In order to find out certain facts I sent out to large employers of labor, some time ago, a circular letter with questions concerning young employees, as follows:

"I am making an investigation concerning particular qualities sought for in the workmen you employ. This investigation, I hope, will aid us in arranging methods of manual training for the upper grammar grades, in order to prepare boys most effectually for any industrial work they may pursue after leaving school."

The following questions were asked:

1. What special qualities do you consider of prime importance in your employees?

2. What influence or school has laid the foundation for the superior skill possessed by your best men?

3. What percentage of your most valuable and skillful men are American born?

4. What kind of training and what study would you suggest for a boy before the age of fifteen to make him the most efficient in your work?

5. General remarks.

About one hundred copies of these were sent out to large concerns, manufacturing and business men, throughout the country employing skilled labor. Replies came from more than half of these. Among those from whom replies were received are the following named concerns: General Electric Co., Lynn, Mass.; Fox Machine Co., Grand Rapids, Mich.; W. F. & John Barnes Co., Rockford, Ill.; Putnam Machine Co., Fitchburg, Mass.; Boston & Maine R. R. Mechanical Dept., Boston, Mass.; American Steam Gauge Co., Boston, Mass.; Fore River Ship Building Co., Boston, Mass.; Waltham Watch Co., Waltham, Mass.; Board of Labor Employment, Boston Navy Yard; B. F. Sturtevant Co., Readville, Mass.; E. C. Atkins Co., Indianapolis, Ind.; The L. C. Starret Co., Athol, Mass.; The Hancock Inspirator Co., Boston, Mass.; Frances Reid Co., Worcester, Mass.; Dennison Mfg. Co., South Framingham, Mass.; Draper Co., Hopedale, Mass.; Baldwin Locomotive Works, Philadelphia, Pa.; Brown & Sharpe Mfg. Co., Providence, R. I.; Pike Mfg. Co., Pike, N. H.; Oliver Machinery Co., Grand Rapids, Mich.; R. Hoe & Co., New York City; A. H. Davenport & Co., East Cambridge, Mass.; American Tool & Machine Co., Boston, Mass.; New York Ship Building Co., New York City, and Regal Shoe Co., Boston, Mass.

The following are some of the replies to the question, "What special qualities do you consider of prime importance in your employee?"

"Steady power to work; capacity to apply themselves to work and carry it to completion, notwithstanding obstacles; natural honesty and sincerity."

"Manliness, intelligence, application."

"Honesty of purpose, concentration of attention, mind open to instruction, willingness to work, enthusiasm."

"Absolute honesty and truthfulness; not afraid to confess blunders when made; added to this, resourceful self-reliance, or so-called Yankee gumption."

"Intelligence, industry, health."

"Honesty, regularity of attendance, accuracy and energy."

"The capacity to apply himself to his work and mind his own individual business. Ability to grasp details quickly."

"Order and neatness."

"Honesty, loyalty, ambition, self-reliance and natural inclination for the work."

"Brains, good health, and willingness to learn and work."

"Health, habits of system and order, love for the work."

"Sobriety, industry and interest in work."

These are only a few out of many answers received, and show very clearly that the special qualities needed are of a general educational character; in fact, very few mention skill or special technical training as being of prime importance.

In reply to the second question, I quote the following:

"A man with a fair education makes a much better workman than one who has had no schooling."

"School of experience. Home influence where old-fashioned virtues have been inculcated."

"Being obliged on account of surroundings to go to work to help support the family."

"The habit of observation and not making the same mistake twice."

"Home training. Respect for parents and superiors."

"No particular school. Boys graduated from grammar schools and having a good record in school as well as retaining what they have learned, are better than high school graduates."

"The general training of an old-time apprenticeship."

"Thorough technical and scientific education in our best schools, including manual training."

In reply to the question "What percentage of your most valuable and skillful men are American born?" the answers vary a great deal, ranging from one to a hundred per cent; the average is between fifty and sixty per cent. Some reply "Very few," and one reply stated "that as union workmen will not teach apprentices, only one per cent of our men are American born."

To the fourth question some of the following answers may be of interest:

"Any exercises which train the eye and hand to be observant of all details."

"Grammar school (complete course); manual training (one year or more.)"

"Good home training and such manual training as is received in the public schools."

"The nearest possible approach to that which is of necessity a New England country boy got a half century or more ago when he had to 'make things do' on the farm, and to make all his toys and playthings if he had any."

"Good home surroundings, grammar school education and an opportunity to handle tools and develop any mechanical ingenuity the boy may possess such as afforded by manual training."

"A training of hand and eye, either in school or outside, in some occupation or diversion with the above result."

"High school course and manual training to give opportunity to see if adapted to any particular trade."

"Manual training is of great importance as developing health and character."

"A fair grammar school education, and manual training to a certain extent."

"Do not teach him *what* to do, but *how* to do anything he may be set at; how to go about it."

Under the heading "General Remarks," I quote the following:

"The State, the city and the town are spending ten times the amount on the boy headed for college than they are for the boy who must go into the industries. In the next ten years this will all be changed, in my opinion. It is the duty of the State, the city and the town to try to educate these boys for their life work, more than the boys headed for the professions."

"The false notion that no lady or gentleman works has caused more trouble than any other one thing."

"Boys who take a course in manual training, including drawing, are better fitted for our work."

"Accuracy in all details and complete mastery of these details are of prime importance."

"We think specialized training before the age of fifteen years has been commenced too early."

"A boy who inherits a natural inclination for mechanics generally succeeds well if he has an ordinary education back of him, whether he has manual training in his early days or not. Manual training would, no doubt, help him a great deal by developing his mind in a way that no other studies accomplish."

"The ability to apply the mind and the hands for a long time without getting sick of it, the 'stick to it,' is to our mind the greatest essential to success."

"Train a man so that he will apply himself to the work he is doing to the exclusion of everything else."

"The main trouble with a boy is inability to apply himself and keep his mind on his work. He should be taught the importance of *accuracy* in shop work, of *being sure of a thing* before going ahead, as a great many mistakes are made in this way, where the work is performed not according to instructions."

"We believe that the training which would be given in this way to boys in the grammar school will be of great value to them in later life, and believe at this age that this training would even be better than the mechanical."

"Keep the public school curriculum as simple as possible. Have teachers who will make study more interesting than it now is to most, and who will, to a degree, correlate this study with the practical things of the world. It often is posible to advantageously interest the student by combining training of hand and mind. The training of mind must predominate."

"If a young man is industrious and shows the natural aptitude for mechanics, the better education he has, the better he will succeed, and the higher he will rise in his trade or profession."

"The trouble with a great many persons is that they are very unsteady. They want to get ahead so quickly they keep changing around, and the result is that they find themselves from year to year just where they began."

In view of these facts we may draw the conclusion that the foundation for industrial efficiency must be laid in the public schools before the age of fifteen, and that sufficient time should be given to such manual training in schools as will help to promote honesty, industry, and health, as well as resourceful self-reliance and skill. We have learned from scientists that what is neglected up to that time in motor training, can never be made up, and you will find that the most successful boy in any trade is the one who has had the best hand training or motor training in the schools. I have in mind several young men from Sweden who have had no special vocational training, who, in coming to this country, have, in spite of the difficulty with the language and customs, worked their way to the top in a comparatively short time, receiving the highest wages paid. This was due largely to the good hand training (sloyd) which they had received in school. Six hours a week is generally given to sloyd in the upper grammar grades of the Swedish schools.

I should like to speak here of some mistaken methods which are often used in manual training.

For years I have been saying to teachers that the finished product should, in every respect, represent the honest effort of the boy, and also that very valuable lessons may be learned from his own mistakes, provided the mistake is recognized and acknowledged by the pupil. We are all well aware that there can be no substitute for honest, muscular and mental effort, as far as training the faculties goes, and it is through the complete training of these that sloyd and broad manual training must form an organic part of education. Consequently I do not believe in using machines as labor-saving contrivances, which will relieve the boy from the troublesome task of using his own muscles and mind unaided. He should do free hand work, without which, it seems to me, we lose sight of our true aim, the complete development of the boy. The easiest and quickest way to develop a box or a piece of furniture is not the best way to develop a boy. These different aims require different methods, and instructors who favor the labor-saving methods, or in any way do the work for the pupil, belong to the shop—not to the school—and the sooner they change, the better. The sloyd method will, in the end, be found to yield the best industrial result. I hope that I am making myself understood; of course I am in favor of using all mechanical contrivances and labor-saving machines for promoting the various industries. Nevertheless, the same method, I repeat, would be fatal in the development of the growing boy. *Both are needed, but each in its proper place.*

I feel that genuine hand work is more needed to-day than ever before, especially among children, because everything now-a-days is so easy to procure. In my own school days, instead of having ready-made blank books furnished by the school, we were obliged to find paper, cut it up, rule it and stitch it, making a book. An automatic pencil-sharpener was unknown. Each pupil had to sharpen his own pencil with his own knife; self-adjusting iron planes were unknown, neither bit gauges for boring aids, nor automatic grinding machines were in existence. We often had to split the logs in making boards, and adjust the plane iron in the old-fashioned wooden plane with the hammer.

While I do not wish to return to the use of the primitive tools, I feel strongly that great precaution should be exercised in taking up all the latest inventions of tools in the schools, as it is sure to lessen the educational value of our work. We deceive ourselves greatly if we think that the accurate product made by the latest invented machine is, in any great measure, due to the man handling it. I have often been shown in machine work the turning of steel cylinders, true up to the fraction of a thousandth of an inch, as examples of wonderful accuracy, much greater than can be obtained by hand work. The fact is, that the only effort on the part of the operator is that he turns a hand on a dial to a certain number, which causes the chisel on the machine to cut as desired. I do not wish to seem to boast, but I feel quite confident that although I never used machines to any extent, I could, in one day, learn to use such machines as a circular saw, band saw or planer, and do as rapid and as accurate work as a man who has used them for years, and this is due entirely to training obtained through the use of the crude hand tools I was obliged to use in my young days.

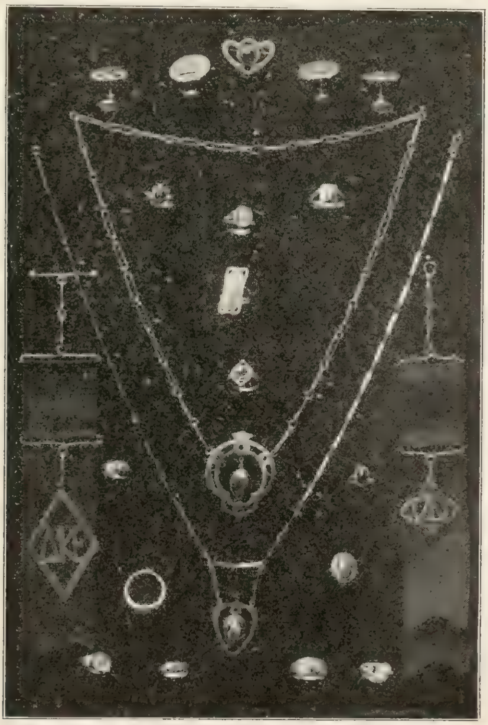
In conclusion, let me quote one of the greatest living American educators, President Eliot, who, in speaking of the teaching of music, manual training and the like, said, "Shall we call the training of these human vehicles of expression, of impression, of reasoning, of apprehension, of observation, shall we call the training of the hand and eye a fad? It is better worth doing for culture's sake than learning to spell or to know the names of the capes, gulfs and capitals of the world, immeasureably better as culture, as training, as giving power."

I have another quotation from President Eliot, who speaks strongly of the contempt for manual work which prevails in this country to an alarming extent, and of the need of implanting the love of usefulness and respect for skill of hand in the minds of both boys and girls while in

school. "At a recent meeting of manufacturers in one of our western cities, the fact was brought out that factory hands frequently go through the streets with books under their arms, so as to be mistaken for school girls. The prejudice against manual labor has inoculated the whole spirit of American life. Our schools, while developing the brain, have misunderstood or even overlooked altogether the mission and the power of the hand. A large majority of parents desire to give their children education of the sort that can lift them above hard work, that is, will enable them to win their way by their wits."

President Eliot is right in complaining that the schools do not glorify labor; he is right also in insisting that unless satisfaction and content with work can become a popular instinct and a trait of national character, we shall fail to realize our political ideals, and our hopes of a social democracy.

"Joy in work should be the all-pervading subject of industrial discussions rather than devising plans to escape manual toil, without ever a thought of its possible glory."



ARTS CRAFTS—COLUMBUS, OHIO.

SIMPLIFIED MECHANICAL PERSPECTIVE—IV.*

FRANK FORREST FREDERICK.

SO far, in this course in perspective, we have found and used only the vanishing points of retreating horizontal lines all of which have been found in the horizon.

It is now time to use the vanishing points of oblique lines, for all lines, whatever their direction, that are not parallel to the picture plane, have vanishing points.

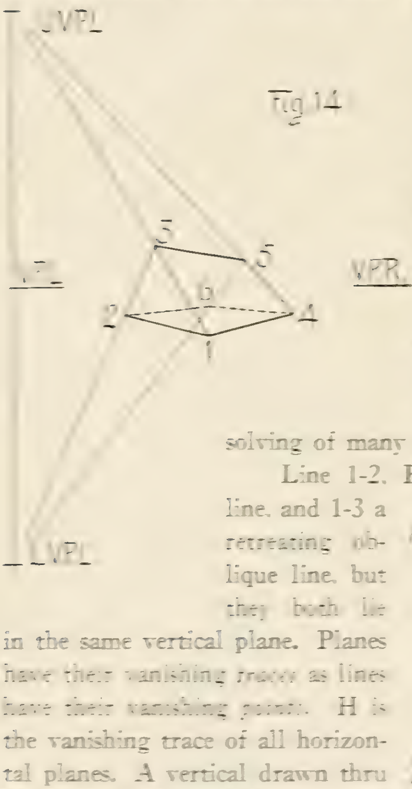


Fig. 14.

In Fig. 14, not only do lines 1-4, 3-5 and 2-6 vanish at V. P. R., and lines 1-2 and 4-6 at V. P. L., but lines 1-3 and 4-5, which are parallel, vanish at U. V. P. L. (Upper Vanishing Point Left), and lines 3-2 and 5-6 at L. V. P. L (Lower Vanishing Point Left.)

If these upper and lower vanishing points can be found in advance, as V. P. R. and V. P. L. are found, their use will make the solving of many problems much easier and simpler.

Line 1-2, Fig. 14, is a retreating horizontal line, and 1-3 a retreating oblique line, but they both lie in the same vertical plane. Planes have their vanishing *traces* as lines have their vanishing *points*. H is the vanishing trace of all horizontal planes. A vertical drawn thru V. P. L. is the vanishing trace of the vertical plane of which the triangle 1-2-3 forms a part. All lines lying in or parallel to a plane have their vanishing points in the vanishing trace of the plane, therefore the vanishing point of 4-5, as well as that of 1-3, must be in this vertical

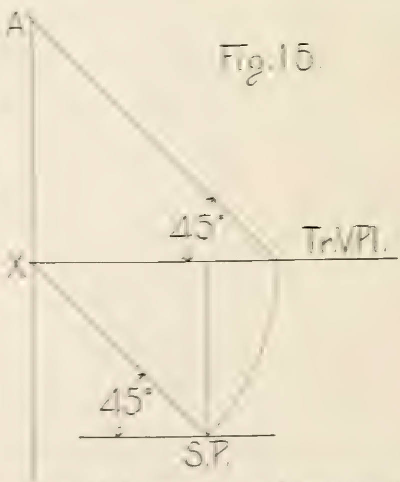
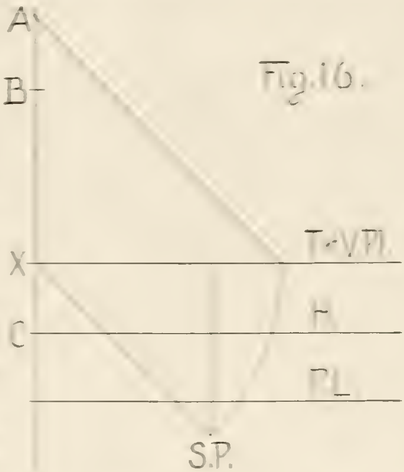


Fig. 15.

trace above V. P. L., and the vanishing point of 3-2 and 5-6 must be below V. P. L.

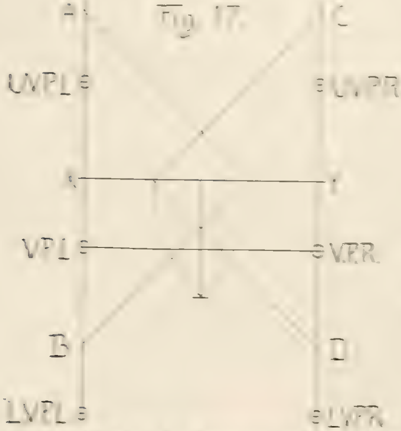
If the vertical plane containing triangle 1-2-3 be revolved to coincide with the V. Pl. the true angle made with the horizontal plane by 1-3 may be seen and the vanishing point of 1-3, and all lines parallel to 1-3, found. It is known that the vertical plane containing 1-2-3 makes an angle to the left of 45°, therefore, Fig. 15, line X-S. P. is revolved to Tr. V. Pl. and the angle made by 1-3 with the horizontal plane (in this case 45°) is constructed and point A found. If Tr. V. Pl. was used as the horizon point, A would be the vanishing point of all lines making angles of 45° to the left with the vertical plane and angles of 45° upward with the horizontal plane.

Fig. 16.



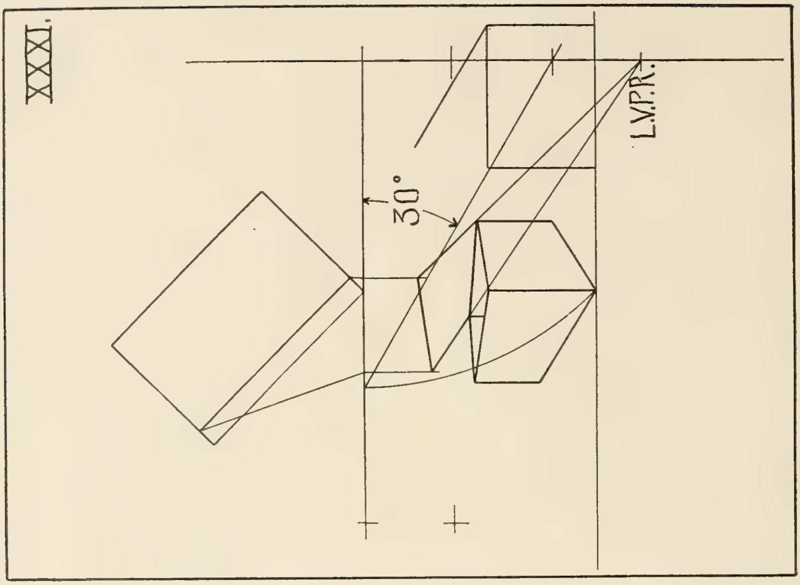
As has been explained (Plate I) Tr. V. Pl. is not used as the horizon, on account of the confusion of lines, but a new line (H) is drawn the required distance above P. L. which is placed wherever convenient.

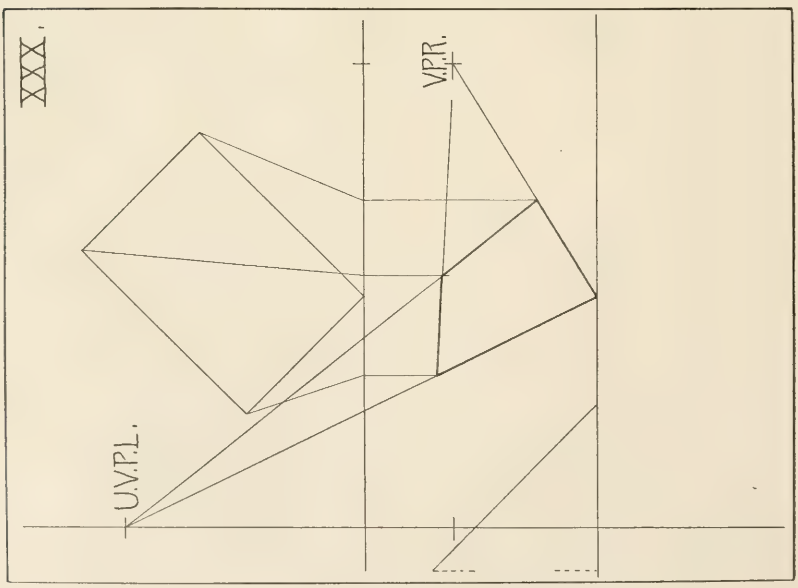
Fig. 17.



As A, Fig. 16, is found to be distance X-A from Tr. V. Pl., the point to be used as the U. V. P. L. (B) is placed as far above H. as A is above Tr. V. Pl. That is, distance C-B is made equal to distance X-A.

A diagram for a problem containing lines vanishing to right or left at 45° with the vertical plane and up or down at 45° with the horizontal plane is constructed as in Fig. 17. Distance V. P. L. —U. V. P. L. is made equal to distance X-A. Distance V. P. L.—L. V. P. L. is made equal to distance X-B. Distance V. P. R. — U. V. P. R. is made


XXXI.
30°
L.V.P.R.


XXX.
V.P.R.
U.V.P.L.

equal to distance Y-C. Distance V. P. R. — L. V. P. R. is made equal to distance Y-D.

In Fig. 14, line 1-2 is included in two planes. It is in a horizontal plane and also in a vertical plane. Its vanishing point is V. P. L. the point of intersection of the traces of the two planes containing the line.

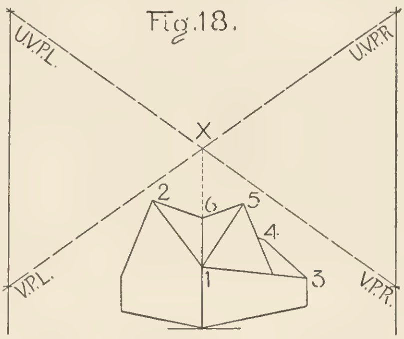


Fig. 18.

Every retreating line lying in two planes has its vanishing point at the intersection of the traces of the planes.

In Fig. 18, U. V. P. L. —V. P. R. is the vanishing trace of the plane containing 1-2-4-3 and U. V. P. R. — V. P. L. is the vanishing trace of the plane containing 1-5-6. Therefore line 1-6, which is common to both planes, will have its vanishing point at X, the point of intersection of the traces of the two planes containing the line.

Problem XXX.

Plate vertical. Scale ¼″ = 1′0″. S. P. 16′0″ to right and 11′0″ above. C. V. 13′0″ from S. P., P. L. at S. P., H. 8′0″ above P. L.

In this problem a square 13′0″ x 13′0″ rests on an edge that vanishes to the right at 45°. The square makes an angle of 45° with the horizontal plane. The square does not, of course, appear as such in the plan. V. P. R. is the vanishing point of the two edges parallel to the horizontal plane. U. V. P. L. is the vanishing point of the two edges making angles of 45° upward to the left.

In laying out the diagram for a problem containing lines making angles with both the horizontal and vertical planes it is always advisable to find the four upper and lower vanishing points that their location may be known before the problem is worked.

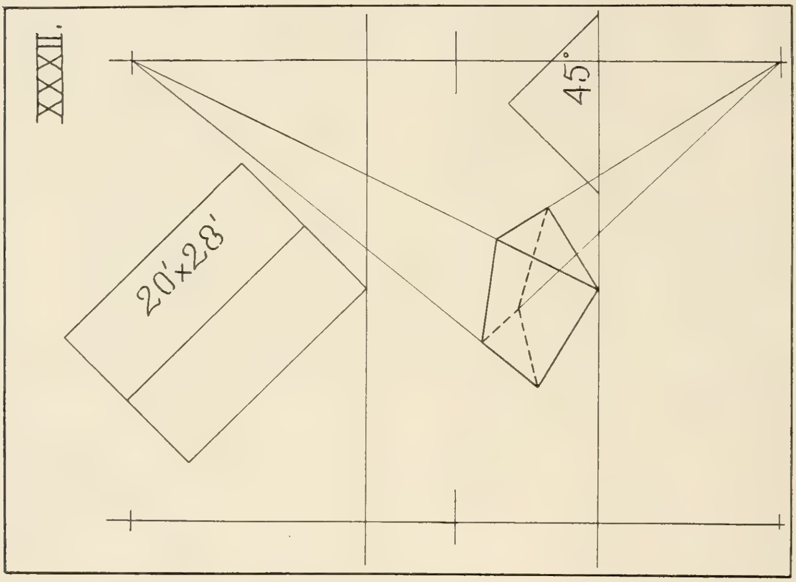
Problem XXXI.

Scale ½″ = 1′0″. S. P. 8′0″ to right and 5′6″ above. C. V. 6′6″ from S. P., P. L. at S. P., H. 4′0″ above P. L.

A box 4′0″ x 6′0″ and 3′0″ deep stands on the horizontal plane as shown by the plan. The cover is open at an angle of 30°.

Problem XXXII.

Scale ⅛″ = 1′0″. S. P. 32′0″ to right and 22′0″ above. C. V. 26′0″ from S. P., P. L. at S P., H. 16′0″ above P. L.



A triangular prism, size and location shown by plane and elevation, is drawn using upper and lower vanishing points.

Problem XXXIII.

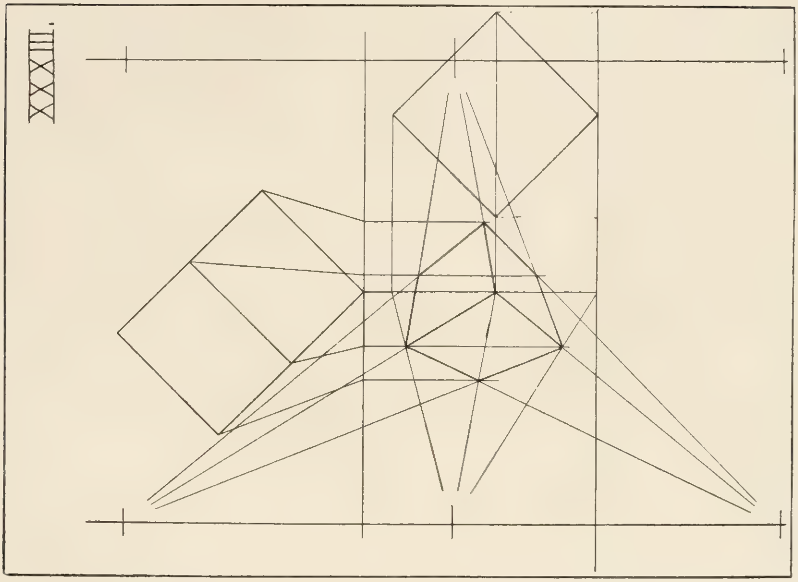
Scale ¼″ = 1′0″. S. P. 16′0″ to right and 11′0″ above. C. V. 13′0″ from S. P., P. L. at S. P., H. 8′0″ above P. L.

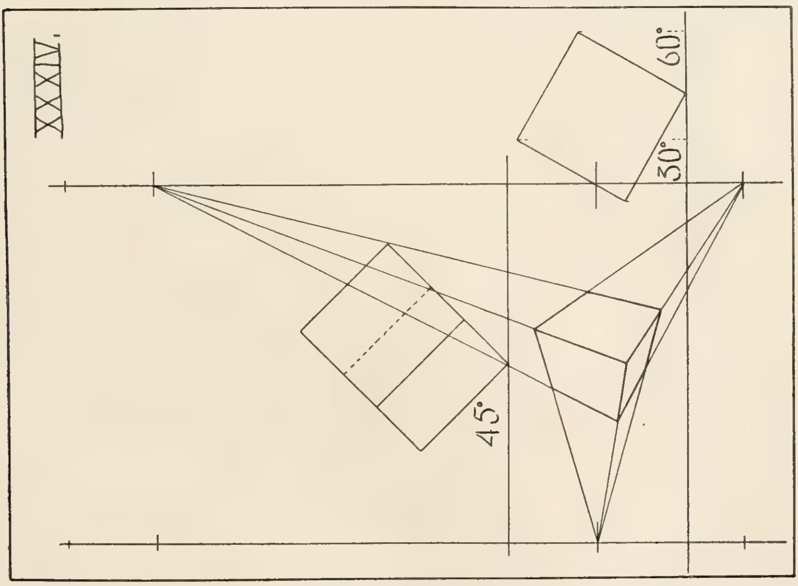
A cube, faces 8′0″ x 8′0″, rests on one edge as shown by the plan and elevation. All lines used to obtain the perspective are lined-in to show how few are necessary to work the problem.

Problem XXXIV.

Scale ¼″ = 1′0″. S. P. 12′0″ to right and 6′0″ above. C. V. 10′0″ from S. P., P. L. at S. P., H. 5′0″ above P. L.

A cube, faces 7′0″ x 7′0″, rests on one edge as shown by the plan and elevation. First find the perspective of the edge of the cube resting in the horizontal plane.



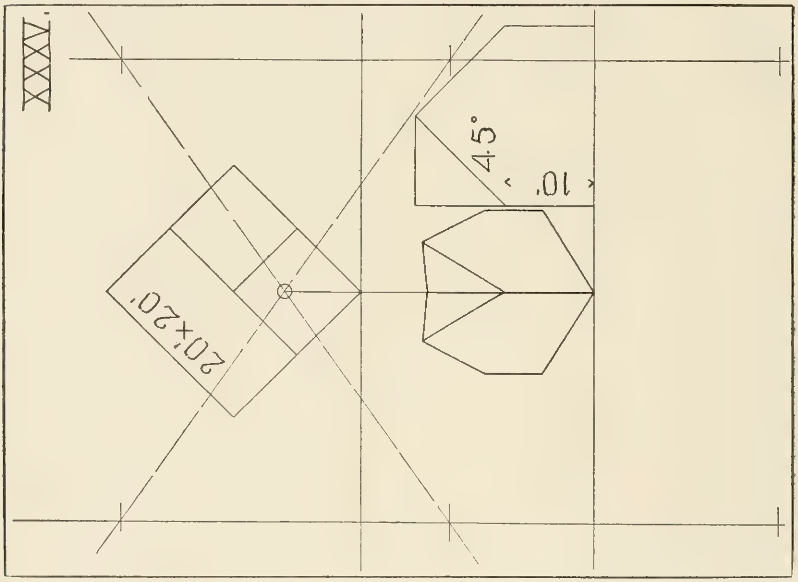


PROBLEM XXXV.

Scale ⅛″ = 1′0″. S. P. 32′0″ to right and 22′0″ above. C. V. 26′0″ from S. P., P. L. at S. P., H. 16′0″ above P. L.

This is a problem that frequently presents itself when drawing

roofs. All dimensions necessary for working the problem are given on the plan and elevation. The intersection of the roof vanishes at the intersection of the traces of the roofs as explained by Fig. 18. It is as necessary for a draftsman making a freehand drawing of roofs to know where the line of intersection vanishes as it is for the architect who is drawing a perspective mechanically.



Problem XXXVI.

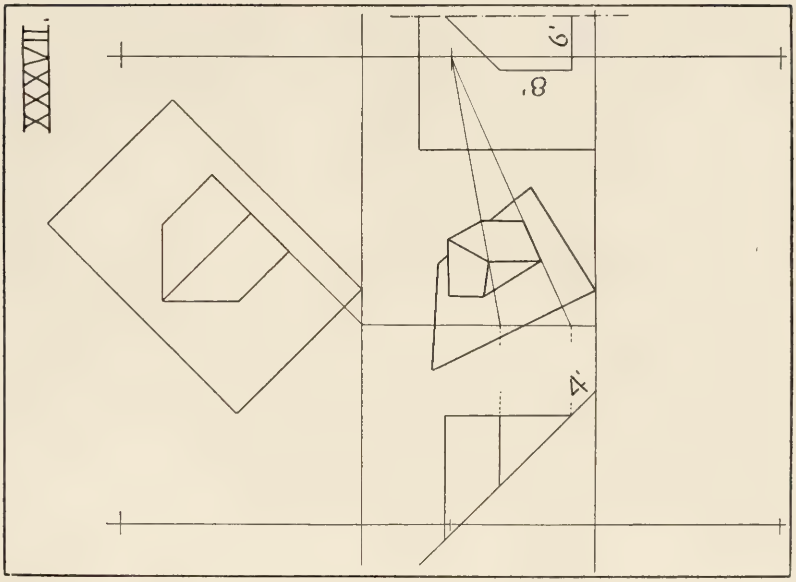
Scale ¼″ = 1′0″. S. P. 16′0″ to right and 11′0″ above. C. V. 13′0″ from S. P., P. L. at S. P., H. 8′0″ above P. L.

In this problem a chimney, 4′0″ x 4′0″, extends from the center of a roof 16′0″ x 16′0″. The top of the chimney is 12′0″ from the horizontal plane.

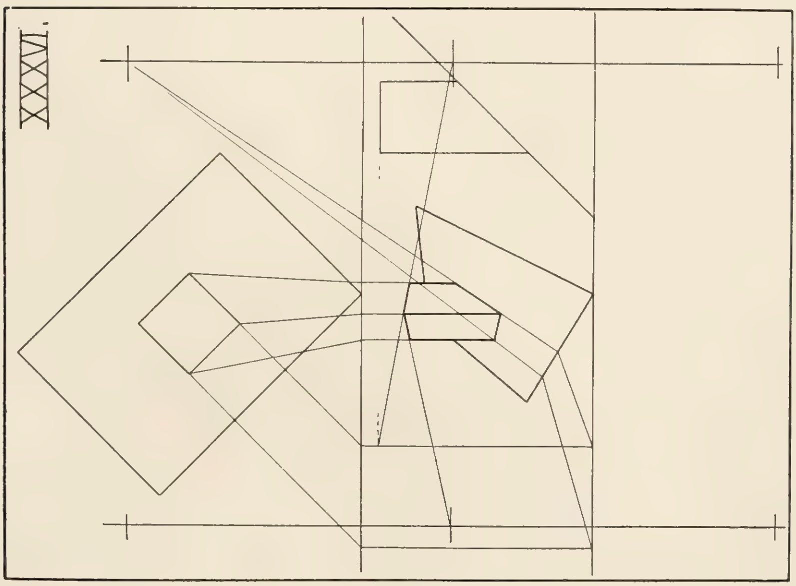
Problem XXXVII.

Scale ⅛ = 1′0″. S. P. 32′0″ to right and 22′0″ above. C. V. 26′0″ from S. P., P. L. at S. P., H. 16′0″ above P. L.

In this problem a dormer-window extends from a roof 28′0″ x 30′0″. Other dimensions necessary for the working of this problem are given on the elevations.



XXXVII.



XXXVI.

MECHANICAL DRAWING IN THE PUBLIC SCHOOLS.

ARTHUR W. CHASE.

THERE are two general branches of education—the industrial and the purely cultural. Following this division we may classify the subjects of study as (a) those studies which are necessary to put one in touch with means of existence; and (b) those which tend more especially to strengthen the mind and at the same time to broaden it. The industrial type of studies of early days may be exemplified by the three R's; while Latin, Greek, history and literature, will serve to exemplify the cultural branches. In more recent times, manual training in various forms has been added to the curricula of various schools. In its pure form this also is largely a cultural study, since its original cause for being was an attempt to train the mind by means of the hand and eye, and through the material rather than the purely ideal.

But because of the processes employed and through the wonderful development of sciences and the mechanic arts in latter days, manual training has quite overstepped its original bounds and is fast taking on an industrial aspect. Manual training schools have become, in a measure, fitting schools for schools of technology and mechanic arts, and fitting schools for industrial life and manufacturing businesses in a thousand and one forms.

In all kinds of employment where production goes on and crude material is changed in form and condition to better adapt it to man's wants, a language and medium of expression is necessary to fully indicate how this is to be done. This medium of expression is known as industrial drawing.

Such then is the reason for considering drawing a necessary feature of to-day's education—freehand drawing for the artistic side, and mechanical drawing for the manufacturing, and oftentimes a combination of the two in order that both may be the more successfully carried out. If then, drawing is to become a prominent and fixed feature in modern education, as seems to be the fact, it is necessary for teachers to prepare themselves in the methods of carrying on the work. In the following statements the endeavor has been made to suggest something as to these methods, and to make such suggestions definite and helpful, but confining them chiefly to the subject of mechanical drawing.

In the first place, the proper location, surroundings, and equipment are necessary to carry on drawing to the best advantage. This means a suitable drawing room, adequately furnished. The drawing room should preferably have a northern exposure in order to obtain the best light for the purpose, which is an indirect light. If northern light only cannot be had, a northern and western exposure is next best. Such windows as are reached by direct sunlight should be provided with fine ribbed glass in the upper sashes, and curtains hung at the middle of the windows should be used to screen the lower lights when necessary. The walls should be of a warm, neutral tint, such as will be restful to the eye. The finish should be of plaster rather than of wood.

Where artificial light must be employed it should be diffused as much as possible. This is frequently accomplished by the use of inverted reflectors.

The drawing room should be located in a quiet place; usually at the top of the building will be found the best. A quiet location is necessary because a drafting room is a study room, and noise and disturbance are great hindrances to clear and successful thinking. It will be found convenient to have the drawing room near the wood and pattern shops, though it is not as necessary in school work as it is in practical work, where the draftsmen are allowed and expected to pass back and forth to the shops as the business demands.

The size of the drawing room will be determined by the number of pupils it is to accommodate. For elementary work the number of pupils per class should not be more than twenty-four. The drawing tables should be individual and detached, in which case an allowance of thirty square feet, that is, a space of five by six feet per pupil should be made. This includes aisle spaces. To the total amount thus obtained, an increase of thirty-three per cent should be made to allow for the teacher's table, storage cases, filing cabinets, model closets, etc. The entire space necessary for a class of twenty-four pupils will be, then, a room twenty-four feet by forty feet, or equivalent area.

It is convenient to have a separate blue-print room, but it should be adjacent to the drawing room and so arranged as to have any pupils, either drafting or blue-printing, under the direction and supervision of one teacher.

As to the equipment of the drawing room, it should be provided, as before stated, with twenty-four individual drawing tables, a large

flat-top table for occasional large work, and an abundance of closet room, filing cases, and storage room for supplies.

For advanced work the classes should be limited to not more than sixteen each, because the problems are much more intricate, demand more individual attention, and require much more intense thought. In drafting room practice a foreman is assigned to each six or eight draftsmen, and he does not have to concern himself with discipline, which in school work is a factor very seriously to be considered. The amount of room necessary for a class of sixteen in advanced drafting is about the same as that required for twenty-four in elementary work, because the advanced work usually requires larger drawing boards, and frequently two or more of these have to be in use at the same time on the same job.

Further in regard to the drawing tables, they should be self-contained, and should have fixed tops. Each table should be arranged to accommodate as many pupils as there are periods in the school day, that is, it should have as many drawers as there are school periods. Each drawer should be sufficiently large to accommodate the entire drawing outfit of the pupil to whom the desk is assigned. The plan of storing drawing boards in a cabinet at one side of the room is much to be condemned, for it causes great confusion both at the opening and at the closing of the drawing hour. Each drawer of the drawing table should be separate from the adjacent drawers and should be provided with a lock.

Adjustable tops to drawing tables for school work constitute a great nuisance because each succeeding class of pupils desires different positions for the tops, whether the changes are necessary or not. When the tops are fixed the tables should be made in groups of three different heights, and under such circumstances every one gets along very nicely. Stools for pupils' use in a public school drawing room are also a great nuisance. They take up much room and contribute a great deal of noise. The pupils are at their boards but a short time and can get along very well if they have to stand. Many professional draftsmen stand at their boards the greater part of eight hours a day for six days of the week.

The next thing to be considered is the individual equipment. Each pupil should own his drawing board and small tools. To equip a school with individual outfits of small tools would entail a large expense to the Board of Education both in the original cost and in the continual

up-keep. Quite enough public expense is occasioned to furnish the supplies which are used, such as ink, drawing paper, tracing cloth, blueprint paper, and the like. To these might be added pencils, pens, penholders, erasers, and similar things, if it is thought desirable, which are consumed, but not the drawing boards, T-squares, triangles, and drawing tools, which should naturaly last a long time and should always be in first-class condition. The most casual examination of the condition of fund tools—that is, those which are loaned by the School Board to indigent pupils—as they are returned to the school office, ought to be enough to convince one that such a practice made constant and general, would not be advisable.

Further, the small drawing tools are delicate and easily damaged. There is probably no more careless individual than the average school boy of sixteen or seventeen. Tools would be handled carelessly and would rapidly get out of condition for use. This would result in some boy's appropriating another boy's compass or drawing pen, or the like, and a constant exchange and interchange would result—much to the dissatisfaction of the teacher and many of the pupils.

Again, the drawing tools are hand-made and finished and are not interchangeable. It might result, therefore, that if A took B's compass pen leg, he could perhaps use it but B could not use the one left in place of his, if indeed A took the trouble to exchange instead of appropriate outright. Whereupon B, not knowing what became of his compass part, would borrow from C, perhaps he would return the borrowed goods and perhaps he would not.

Such constant oversight and watchfulness as would be required of the teacher to keep a large number of small tools in their proper places and in good condition would entail upon him an immense amount of work and an expenditure of energy that might far better be put forth in obtaining good and constantly better results in the drawing work.

Moreover, common ownership and use of a large number of small tools by many pupils is not sanitary.

Many a boy comes into the drawing class with hands so soiled and perspiring that another would prefer not to use the drawing tools after him. It is a common impulse with draftsmen, to hold the drawing pen, or pencil, in the mouth for the moment, while adjusting the triangle or doing some similar thing. While this is never commendable it would be many times less so with common-property tools.

It may be said also that owning a drawing outfit is a good incentive to its use. Just recently one of my pupils earned the price of his outfit by making three small drawings.

Now, having considered school and individual outfits, let us see what is to be done with them.

A course in mechanical drawing is appropriately opened by a drill in lettering. Ability to do good lettering and make neat figures are first essentials when a young draftsman applies for work—properly so, too, because his first work is almost invariably making tracings of some experienced draftsman's work. The lettering used should be a single stroke or skeleton letter because it is most easily and quickly made, is sufficient for the purpose and is very legible. The Rheinhardt or *Engineering News* style—an inclined letter originated by Mr. Rheinhardt, chief draftsman for the *Engineering News,* is deservedly popular. Some, however, prefer a vertical letter; this is used on the drawings made by the U. S. Navy Department. The Roman style of lettering should not be attempted by beginners. It is by all odds the hardest style of all to make, and the very worst looking when not excellently made. For advanced mechanical drawing, a geometric letter will answer nicely, and it can be made to look very well by a draftsman of no artistic taste. For architectural work, a single stroke letter in old style form will be found appropriate.

After a brief exercise in lettering, the young man should next take up geometrical drawing, supposing, of course, he has not previously had it. In presenting either geometrical drawing or projection drawing, the language used should be as free as possible of technical terms and the difficult methods of advanced mathematics. In carrying on this work both pupils and teacher should have the assistance of a well arranged book stating the problems clearly and definitely. Mechanical drawing is based on a branch of mathematics and like all forms of mathematics requires definiteness and exactness.

Remember that all these suggestions are intended for class work, and for unification of the work throughout a corps of many teachers, some of whom, perhaps, have not had that training in college theory and shop practice, which makes them fitted in the broadest way. It will readily be seen that where one independent teacher, handling a small class, may indulge in individual methods, a large corps of teachers handling each a large number of pupils, some of whom are liable to transfer to another school, should closely follow identical methods clearly and ably defined.

A textbook for pupils' use on the subject of mechanical drawing may well open with descriptions of the tools to be used, statements of why the forms specified were selected, and information upon the care and use of the tools. These matters will prove interesting and instructive to the pupils, will give them respect for the materials placed in their hands, and will help towards the preservation of the outfits.

Passing now to a consideration of drawing itself, it is my opinion that few or no plates showing finished problems required by the course should be placed in the hands of pupils. Copying of such finished plates would surely follow, and that kind of work is of little value beyond affording a chance to inspect and imitate the technical style of an experienced hand, which is a matter of little moment in comparison with developing the mind in thought and imagination. Exercises designed solely for the acquirement of facility and skill in the uses of instruments should be eliminated, for these attainments are easily and naturally acquired as the work advances, and the time so saved can be put to much better use.

Geometrical drawing should be used as an introduction to constructive or applied mechanical drawing. It is the foundation of all drawing either for industrial or for artistic purposes. It involves the consideration and representation of only two dimensions, is therefore simpler than orthographic representation, which involves three dimensions, is more easily comprehended by the pupil, and is in every way an appropriate stepping stone. Few pupils are competent, either through natural fitness or previous training, to appreciate the exactness required in instrumental construction drawing, or to reason in logical order from given premises to the proper conclusion. For both these ends, geometrical drawing affords a satisfactory medium.

To further emphasize my views upon this matter I will quote a selection from an address delivered by John S. Clark, head of the Prang Educational Co., before the University Convocation of the State of New York. He said:

"In the arrangement of the instruction there should be introduced what is called geometric drawing, that is, drawing problems in plane geometry with the use of instruments. These problems find application in the accurate construction and subdivision of the geometric figures, for design, as well as in all kinds of construction work, such as machinery, building construction, masonry, pattern-making, etc.

As in these applications the greatest accuracy is required, and as this accuracy can be secured by no other means than by geometrical drawing, its great

and paramount importance will, I trust, be apparent. Indeed, I will go so far as to say that if this subject be left out of the course of instruction, if it be not from the first regarded as fundamental, if all the other subjects be not arranged as subsidiary or complementary to it, such a scheme can have no broad claim to recognition in the public schools.

This may seem a strong and fanatical statement, but I shall fail of my present purpose if I do not make this point clear before I close.

Begin by such simple problems as the bisecting of lines; the erecting of lines perpendicular to others; making angles equal to given angles; on a given base to make a pentagon; and others of a similar nature. In short there is no requirement in the construction of any object, building, or machine, which cannot be expressed by a geometric problem.

Before starting geometrical drawing it will be found necessary to give the pupils some information upon the magnitudes to be considered, by means of definitions. However, these definitions should be confined to the fewest in number, and the simplest in nature with which it is possible to start. Then the more difficult and elaborate ones may be introduced as the objects or conceptions which they describe are to be dealt with.

The same method of procedure should be adopted when the subject of projection drawing is being taken up. It is worse than useless to burden the pupil's mind with descriptions of many things with which he has never come in contact and which he will not need to know about about for some considerable time.

In regard to the selection of geometrical problems, they should be few in number and such as are fundamental in their nature, and capable of the broadest application. The construction of very unusual regular polygons upon a given side, the duplication of irregular polygons of a large number of sides and of indescribable shapes, are not fundamental in their nature, and may well be omitted till some special occasion demands their consideration. Also, complicated curves like ellipses, cycloids, and involutes, are not necessary to the beginner, are difficult of comprehension, and special in application, and should be postponed till a later date. Each problem should preferably not introduce more than one, or at the most two, new principles, but on the other hand, it should utilize the principles developed in preceding problems, as a matter of review, to show the application of previous work, and to impress it more thoroughly upon the mind. These statements apply equally well to projection drawing.

In introducing the subject of orthographic projection, the pupil should be called upon to deal first with the concrete rather than the

abstract. That is, he must first consider, and picture in space, the solid which is a fact, rather than the point, line, and plane, which are ideas, and not perceptible to the hand or eye. This treatment is contrary to the method employed in descriptive geometry, upon which the science of orthographic representation is founded, but it concurs with the principles of psychology, and in practice it proves to be the best way. Models of objects to be represented and of the planes on which such representations are made, should be used for the first few problems and until from the study of these models, the pupil learns the fundamental methods of conventional orthographic projection. Then by analysis of the representations of these concrete objects the pupil makes deductions in regard to the representation of the abstract point, line, and plane, and formulates rules in regard to other representations.

But, models should be dispensed with as soon as possible. After a little practice, and when the methods of orthographic representation have been acquired, a pupil will read a model, and picture in his mind its different views almost as readily as he would read a drawing. Obviously this is not good training for the imagination and is not conducive to original work on objects or constructions which have never existed. Therefore models should not be used except in special cases, throughout the latter and larger part of the course.

Again, exact specifications should be given for each problem. Unless this is done exact results cannot be expected or attained. Nor is it to be expected that a teacher can do this verbally. To repeat the specifications exactly and completely to several succeeding classes, especially without recourse to notes, is a monumental and wholly impossible task. Utilization of a blackboard for this purpose involves an immense amount of work because the statements can be left on but a short time and then must be replaced by others, while later the entire work must be done over again. Such methods result in unsatsifactory uncertainties on the part of the pupils, and a great waste of energy on the part of the teacher. An architect, engineer, or designer, is constantly required to conceive and represent something which never existed. His work is necessarily based on descriptions, specifications, and requirements, and the more exact these are, and the more definitely and completely they are placed before him, the more satisfactorily he can arrive at the desired result. The endeavor, therefore, should be made to have pupils acquire the ability to execute from given specifications and according to certain conditions.

Ability to do this is of the greatest value in any and every line of business.

As has been stated before, the work in projection drawing should be arranged to give a regular development of principles, and in nearly every problem a new principle should be introduced, the exceptions being in those cases where several problems utilize the same principles which, being difficult of comprehension or important in their bearing, are thus strongly impressed on the minds of the pupils. In this way past work is constantly reviewed, new work is introduced gradually, and no single feature is given an undue amount of time.

The pupil should be taught what the layout of a sheet of drawing is and how to make it, but for school work the layout should be given for the majority of the problems. This is because the drawing sheets should be of fixed and rather limited size, and the dimensions prescribed for the objects should be as large as possible in order to afford clearness to the drawing. The marginal and waste spaces should be as small as possible and the result will be that in nearly every case the layout must be more carefully planned than would be necessary even in professional work. Indeed the professional draftsman concerns himself very little with the layout of a new piece of work. He simply takes a piece of paper that he is confident is more than large enough and sets to work, reasoning that a slight loss in the expense of too much paper used, is far better economy than a great loss in time and work in having to start over again besides resulting in an avoidance of much annoyance. It is chiefly when making a uniform set of detail drawings from an assembly drawing already constructed, and for the convenient use of the mechanic, that the draftsman pays very close attention to a studied layout. Finally, it may be said that the layout is a mere mechanical detail tending to the good appearance of the drawing and after a knowledge of what it is, what its purpose is, and how it is made, has been acquired, it has no further educational value, and the time and energy of the pupil may thereafter be conserved by giving him the layout of the problems directly.

In giving the specifications and layout of a problem no reference should be made to the axes of projection—a common fault—beyond a few instances in very elementary work and before the scheme of center and base lines is fully developed. Remember that axes of projection are purely imaginary and theoretical, that their positions in relation to

the object are of little moment, and that they are not met with in practical work. There, all measurements and distances are referred to a base line representing the floor or ground, to center lines of the object, or to finished surfaces, or to lines or surfaces of similar nature.

The method of representation used in projection drawing should conform to the best modern practice. That is, all views should invariably and exclusively be represented by the third angle method of representation which results in each instance in the object being shown as viewed from a position adjacent to the side presented. This is contrary to the method of descriptive geometry which usually employs the first angle, and to the old style of projection work, but without question it is the clearer and better.

A report by a sub-committee of the New York State Art Teachers' Association appointed in 1896 to investigate and report upon the methods of projection in use by professional drafting offices, technical schools, colleges, manual schools, and supervisors and teachers of drawing, shows by a summary from nearly 1,500 answers received in reply to letters of inquiry relating to this matter, that 82 per cent of the professional draftsmen, 80 per cent of the technical schools, colleges, and manual schools, and 92 per cent of the supervisors and teachers of drawing used the third angle method of projection. It is probable that the percentage to-day is still more strongly in favor of this method.

As to what should be included in a course on orthographic projection, I shall indicate by the briefest outline. Such work has been well laid ont by several authors. It consists, first, of an unfolding of the scheme of orthographic projection, next the representation of the simplest plane-faced solids placed in what may be considered as natural positions, then the representation of more intricate objects, in inclined and other similar somewhat unusual positions. Following that, should come a drill on similar representations as applied to curve-faced solids. Next would come a few problems on the intersecting of solids by planes, and a brief study of sections and developments. Then intersections of solids by other solids, with developments of the intersected solids. Finally, a little isometric work, some shade-and-shadow problems, and perhaps one or two in perspective should be given. Scattered through the course may be a few applied construction drawings.

In regard to the introduction of working drawings in the early part of a school course in mechanical drawing, the following may be said: The applications to practice work of principles evolved in theo-

retical work may be shown in some problems, but the latter should be few in number and skillfully chosen as to character. While for some reasons it would seem desirable to use this plan in connection with other problems, it is usually found better to reserve such applications for a later and special course, because they involve much technical instruction on subjects outside the bounds of elementary mechanical drawing. After the ability has been acquired to represent the ordinary geometric solids with their points, lines and surfaces in various positions and relations as usually taught in projection work, a student is ready to begin making working drawings for practical construction work. Such drawings show a workman what to make, how to make it, and of what size to make it.

A working drawing, to be properly executed, must be rendered in conventional style with such detailed information as shall make possible the accurate construction of the object represented without further particulars being given, and the information conveyed should be given in the simplest and clearest manner possible. To make a working drawing well requires good judgment, considerable knowledge of the processes through which the parts shown will be put in course of construction, some information concerning materials, and concerning tools, both hand and machine, an understanding of the purpose of the construction shown, besides some skill in the use of those conventional methods of representation which practice has shown to be well adapted to constructtion work.

It follows from the foregoing that, while a pupil may begin making working drawings after a brief experience with projection drawing, it seems better that he should not do so if he is to devote a considerable amount of time to mechanical drawing—upon which supposition this article is proceeding. The reason of this is that while in some cases the drawing of forms and proportions will not occasion him great trouble, the reasons for the construction, the shop methods to be employed, and the other practical points to be considered will bother him greatly. The result is that his problem would develop into a lesson of how the actual construction is made rather than how he shall acquire the ability to graphically express that construction. That is, he will be spending his time learning shopwork and related matters rather than learning drawing. Hence it seems far better to nearly finish the elementary drill on expression before taking up the problem of what to express. In this way the pupil qualifies himself to perform work presenting difficult problems

in representation without any conscious effort so far as that part of the labor is concerned, thus leaving him free to devote his time and best thought to the question of practical construction.

Mechanical drawing, it must be remembered, is merely a language and means of expression. Viewed in this way it is easy to see that before a draftsman can make a working drawing showing definite knowledge of an object to be constructed and conveying correct and explicit information regarding the matter portrayed he must first acquire such knowledge and information. An attempt, therefore, to make a pupil construct a working drawing of an object of whose purposes he knows little or nothing, and of whose method of construction he knows perhaps no more, is an illogical thing and an unreasonable one. He must first know about the thing before he can tell its story. That is why shopwork should precede drafting; that is why the shop educated man makes the more valuable draftsman; and that is why so many young men from scientific schools have, in the past, made inefficient workmen in the drafting rooms of manufacturing establishments.

It has been the policy in some schools to require the pupils to make the working drawings of all the constructions which later they produce in material form. While such procedure approximates shop practice in that it causes the drawing to precede the construction, it is not logical for the reasons given above. Moreover, it is not educative, for it consumes in mere mechanical production of drawings having the simplest principles, a great deal of time which should be expended in learning to represent subjects involving principles of much more intricate nature.

A series of articles entitled "Manual Training Fallacies," has recently been apppearing in *The Manual Training Teacher,* which is the official journal of the National Association of Manual Training Teachers of England. The second fallacy to receive attention is "That drawing should always be associated with, and should always precede, handwork."

Following are some quotations from the article in question:

It behooves us to examine ruthlessly the present methods of handwork in schools. As it is an accepted fact that the young human being grows through all the stages of evolution from primitive man up to modern man in a short period of sixteen or seventeen years, and that he repeats the acts of his forbears step by step, it must be obvious to any thoughtful person that the processes of evolution should be recognized in educational work.

Did early man construct, or make, or fashion, his implements, tools, utensils,

clothes, etc., after he had scratched their shapes on soft clay or some other convenient medium, and according to the designs so pictured?

From our knowledge of him we know that his drawings were a much later development of his hands than were his constructive arts. Take the trouble to study your own boys and girls, and you will find, first, the destructive element, then the constructive element, and finally the scratchings, scribblings, drawings, etc.—that is, the representative element.

Such is the natural order and it may be seen to a greater or less degree in every child. Most of our models for handwork require mechanical drawing—require views which the child never sees in reality, in his ordinary life. His view of an object, as a rule, gives three dimensions—apparent length, breadth, and thickness—all at once.

Many teachers will agree with the statement that the new and strange subject of mechanical drawing is particularly difficult for the average boy to grasp.

There are many tricks and devices for the teaching of this kind of drawing, but the necessity for the use of such devices fully proves that the method is unnatural at particular stages of mind growth, and should be introduced by very, very slow steps, and only after the boy has been allowed to do constructive work with the primitive tools.

This fetish of accurate mechanical drawing first, construction afterwards, must be strangled, and it is well to have it done at once.

Why should a boy just beginning handwork be compelled to make a mechanical drawing of an object before he is allowed to use his constructive impulse to hammer, to saw, and to build?

There is no scientific reason for it. The idea originated with the artisan who has become accustomed to work from drawings.

The artisan does not realize that he is dealing with a young and undeveloped mind. He was called in to help the teacher at the start, and, of course, his adult ideas have received the stamp of inspectorial favor. To obliterate that stamp will require some hard work, but it must be done."

In regard to the finishing of drawings, some teachers object to inking them, claiming that it is unnecessary, that it is a waste of time, and that in practical work it is never done. Like most arguments, these statements have some measure of truth and some of falsity. It is probable that in actual practice something more than 50% of the drawings made are inked, and of course all tracings are inked in order to afford good blue-prints. And the first work that a young draftsman is called upon to do is almost invariably copying, by means of tracing, the drawings of other workmen. It is necessary therefore for him to know how to use his drawing pen well and quickly, which means considerable previous practice.

Further, inking of drawings seems especially desirable for school work because pupils are apt to be careless and to come to the drawing room from the shops or playground with soiled hands. Also, there is,

in a school, always a certain amount of fine dust, due to the hundreds of feet coming from outdoors and moving about the school building at frequent intervals, which settles upon the desks, drawing tables and drawings, and tends still further to soil the paper. An inked drawing can be cleaned and the work made presentable, whereas a pencil drawing can not, for which reason the inking of drawings seems a desirable feature.

But further than this—as into tinting or wash drawing—it is not desirable to go. Such work is done to a very slight extent in architects' offices, but only in exceptionable instances, and then on the very highest class of drawings. It is never used of late years on drawings for shop use in factories. Sufficient knowledge of the handling of water colors can be obtained in the freehand department.

Some claim is made that wash shading is valuable as an aid in understanding the forms of objects portrayed, but this seems like inverted reasoning. The question would appear at once to arise as to how the pupil, if he does not understand a form shown, is to tint the surfaces in the drawing so as to show that he does understand the form. The situation seems to be summed up in this: That if wash shading and tinting were necessary or highly desirable, in would be used in practical construction drawing, but inasmuch as it is not so used, the inference is that it may be dispensed with and the time so saved be put on more desirable work.

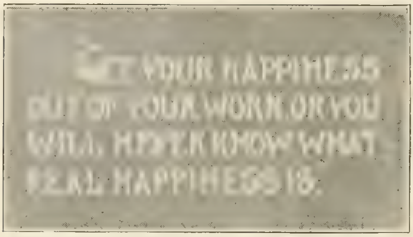
In closing it seems well to again refer to a point which has already been mentioned, namely, a uniform course of work to be placed in the hands of the pupils and one which is minute, exact, comprehensive, and logically developed. Such a course will necessarily be more or less voluminous, but that only goes to show what the teacher must attempt to give the pupils verbally if the matter is not put in their hands in the way of text.

As to verbal instruction, the lecture system is not adapted to high school pupils—and possibly not to any others— for it is extremely difficult to catch all that is said in a lecture, and it is impossible to retain it all except by means of notes. To make these notes each pupil would need to be an expert stenographer and even at that a vast amount of unusual work both tiresome and unnecessary, would be involved.

Again it is not to be expected that each teacher of a large corps would naturally be equipped with the same identical ideas, or that any

teacher can be expected to give just the same instruction verbally to several sucessive classes.

Moreover, the pupils need the time that would be consumed in the manual work of note-taking, in which to do their drawing, and the teacher needs much of the time he would expend in lecturing, for the inspection and correction of the drawings, for where each drawing is inspected both after penciling and after inking, as it should be, and perhaps at other times also, the time thus consumed is very considerable.



DONE BY STUDENT IN STATE NORMAL UNIVERSITY, NORMAL, ILLINOIS.

A PROBLEM IN WOOD-TURNING EQUIPMENT.

J. E. Painter.

SOME eighteen months ago it fell to the lot of the writer to plan the equipment for the manual training department of a new high school. For the purpose of acquainting himself with the newest ideas along this line he visited many of the leading manual training schools of the country. He found much that was worthy of imitation but for one thing he looked in vain, viz.: a wood turning shop properly equipped for manual training purposes. This is not saying that there was any lack of fine machines and suitable tools, but everywhere the same dreary wilderness of overhead shafting and flying belts was in evidence. In only two instances did he find any attempt to get away from the time honored countershaft and two belt method of power transmission. In one of these, individual motors had been placed on the ceiling and only the vertical belt used. While less objectionable in some ways there were evidences that the plan was far from satisfactory. In the other case the power was transmitted direct from the line shaft to the lathe by means of a friction clutch. This plan was said to be highly satisfactory, but—it was overhead, and any overhead arrangement must possess in a greater or less degree many objectionable features. Among these are the following: a. It is *unsanitary;* the supporting frame work, the shafting, and the wilderness of belts obstruct the light and serve as a lodging place for great quantities of dust which is shaken down and breathed into the lungs of pupil and teacher whenever the machines are put in motion. b. It is *noisy;* an especially objectionable feature if the shop happens to be located under or near a class or study room. c. It is needlessly expensive, both in first cost and in maintenance. The same power efficiency can be secured with one-half or even one-fourth the usual amount of belting; an item well worth considering. Other objections might be mentioned but these are sufficient for our purpose.

To show how we have eliminated some of these features and rendered others much less objectionable is the purpose of this brief article.

Having decided that all overhead shafting and belting could and must be dispensed with we set for ourselves the task of either finding or devising a substitute which would be no less efficient and reliable than the old method and would be free from its defects.

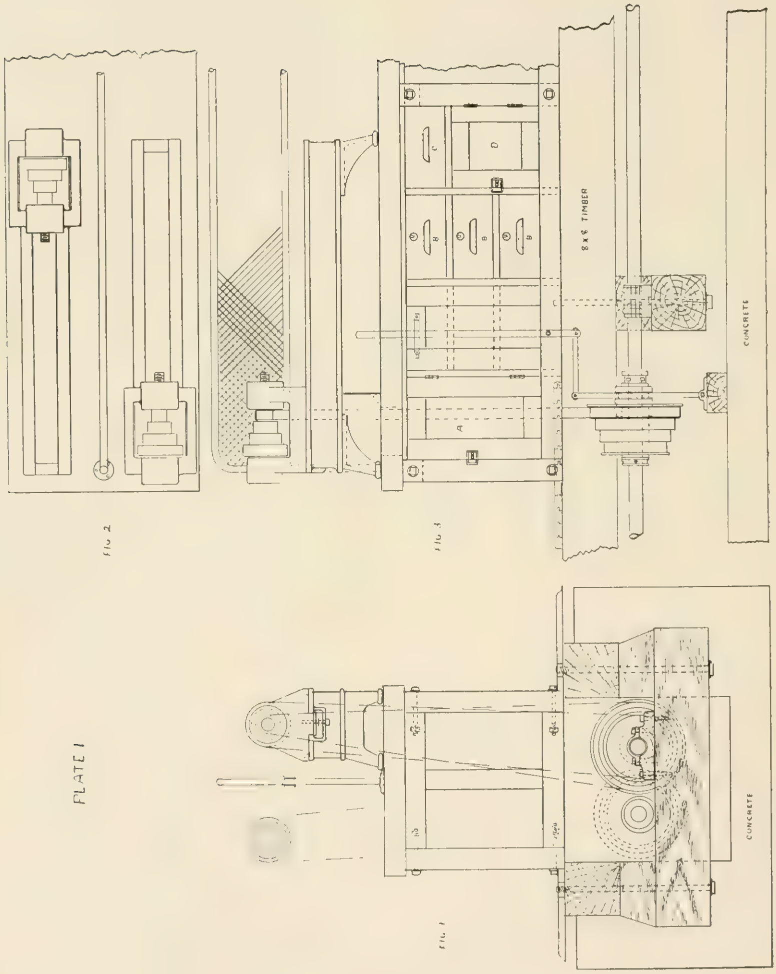


PLATE I

FIG. 1

FIG. 2

FIG. 3

The motor head lathe and the individual motor with belt drive were both carefully considered and dropped as too expensive and of doubtful practicability. The plan adopted finally was to group the lathes in somewhat the usual manner, place the line shaft below instead of above, and drive direct from shaft to lathe by means of friction clutch and belt. Our general arrangement of machines grew out of the necessity of economizing space, it being necessary to find room for twenty lathes and lockers for sixty boys in a space fifteen by thirty-eight feet.

The elimination of as much noise as possible being one phase of our problem, very careful attention was given to the foundations upon which the machines were to rest. These were built of 8″ x 8″ pine timbers which were first treated to a heavy coat of asphaltum paint, then framed and bolted together and set in solid concrete, in such a manner as to form two parallel pits or channels, each two feet deep, two feet wide, five feet apart, and joined at one end for a distance of about five feet. Plate 1, Fig. 1, shows a cross section of one of these channels and Plate 2 indicates the reason for the joining at one end. In each of these channels are two line shafts mounted in duplex oiling pillow blocks. The driving cones are mounted on high speed friction clutches which are operated by means of compound levers as shown in Plate 1, Fig. 3. Over these, and resting directly on the foundation timbers, are the lathe benches, so arranged as to form two groups of ten lathes each, five for each line shaft. Fig. 2 shows the arrangement of the lathes on top of the benches. Also the special construction of the head stock, so designed as to allow the belt to pass downward. The wire screen protects the operator from the chips of his neighbor on the opposite side of the bench. The door in the bench at A admits the operator to the belt and to the pulley below. By removing certain of the bottom drawers the shaft bearings are easily reached for oiling. For each lathe there are three individual lockers or drawers, B, B, B, and a drawer, C, for such tools and appliances as are used by the boys in common. The little cupboard, D, provides for extra chucks, tool rests, oil can, etc.

The question of how best to communicate the power to the line shafts presented a unique and, for a time, rather puzzling problem. After about every conceivable method had been considered and found wanting in some important particular, the extremely simple plan shown in Plate 2 was suggested and immediately adopted. It works perfectly.

After a test of four months we are prepared to say that the arrangement here briefly described more than meets our expectations. We have

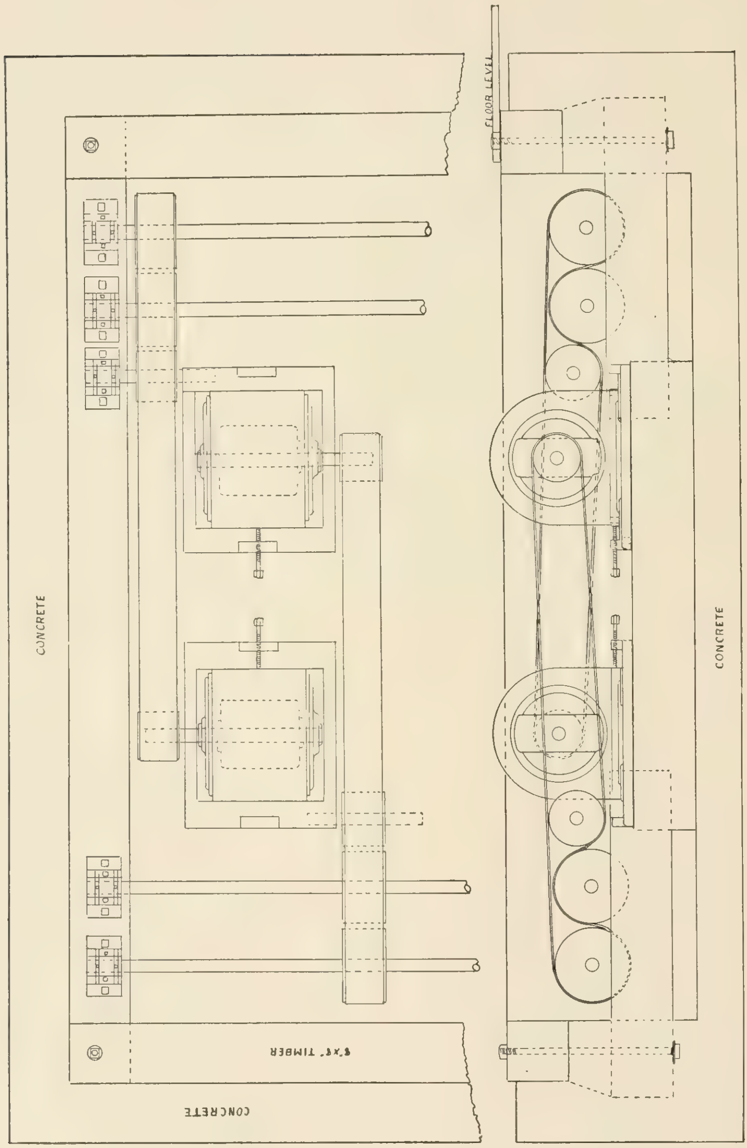
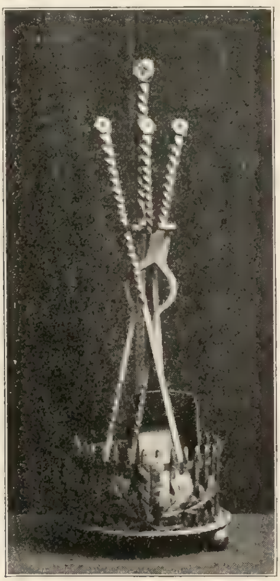


PLATE 2

gained much and lost nothing that could be considered desirable. As compared with the old shops the noise is conspicuous for its absence. In the old, one needed to shout to be heard at all; in the new, we find no difficulty in conversing in an ordinary tone when all the machines are in operation.

One weak point in our plan, which the reader will probably discover, is the difficulty of getting at the line shaft in case anything should go wrong with the bearings or the clutches. This, however, was not an oversight but merely a sacrifice of convenience to save a slight expense. Our original plan was to construct a sub-basement of sufficient dimensions to allow the operator to get at his shafting from below. It was discovered when too late, that this plan could not be carried out without considerable extra expense because of certain underground pipes and conduits which had been laid before our plans had been accepted.

We are not yet ready to claim perfection for our plan but it is so far superior to anything else we have seen in this line that we are highly pleased with the result of our efforts thus far.



MADE IN FORGE SHOP OF THE ILLINOIS STATE REFORMATORY, PONTIAC.

EDITORIAL.

THE fragrant days of June have come again and have brought with them the full color in the roses on our cover page. To us this is of more than passing interest; it recalls a bit of sentiment that helped to shape the design that has enclosed our title and table of contents for the past two years. When the old plate of the oak leaf border became too worn for further use, we sought a new motif. We wanted one that would stimulate a worthy thought as month by month we look upon the cover page as it comes up fresh from the print shop. Such a motif was found in the wild rose—not because of its form or its color alone, but because by nature this simple, sweet-scented flower clusters along our highways and borders many of our pleasant pathways in the prairie states. It seeks not to occupy the center of our view so much as to be on the fringe of our vision and there to reflect the softest hues and give forth its delicate odor. Its modest appeal is always to our finer senses.

In at least two ways, then, the prairie rose is a fitting motif for the cover of our magazine—it reminds us that the magazine comes from one of the prairie states where the wild rose grows in profusion, and that its aim is not only to proclaim the value of education thru handwork that is true and strong but also handwork that appeals to our sense of beauty. How many of our readers would like to have us substitute a border of claw-hammers and jackplanes for the border of prairie roses?

Important Editorial Change

For ten years the editor has solicited contributions to this Magazine, has plied his blue pencil without mercy and then sent the articles forth for such good or ill as might come to the author, the Magazine and the cause of manual training. The years have not seemed long—indeed very short on the whole. The work has been most inspiring. The personal touch with leaders in every part of this country and in foreign lands has repaid for weary hours and midnight oil; and irate authors whose English has been mutilated or pet phrases rejected have furnished sufficient entertainment to prevent dull monotony. When the editor has felt keen disappointment as he sent forth the result of his labors, there has always been someone to

send him a letter stating that the number just received was the "best yet." This has inspired new effort. There is nothing like such letters to make on editor's life worth living.

But one may have too many things to do, each of which is worth doing and very agreeable. This seems to be the case with the editor at the present time, and on that occount he has decided to give up the work of managing editor. This does not mean that he will have less interest in the Magazine, but merely a little less work to do for it. With the advice and help of the associate editors he will still direct the general policy of the Magazine and be responsible for the editorial and reviews departments, but he will not have direct personal responsibility for the editorial work on the other departments of the Magazine. The editor has been very loath to give up this work and he would not have done so at this time had it not been possible to turn it over to one whom he feels sure is in every way qualified to carry the Magazine forward to better things in the future.

Beginning with Volume XI, William T. Bawden, editor of the Associations department and director of manual training at the Illinois State Normal University at Normal, Illinois, will be the managing editor, and from June 1st, 1909, he will receive contributions for publication. Everyone who knows Mr. Bawden or is acquainted with the editorial work he has already done in his own department and as managing editor during the past two issues while the editor was in Europe, will congratulate him on a promotion well earned.

Mr. Bawden was born in Oberlin, Ohio, but spent most of his boyhood days in the college towns of Champaign, Illinois, and Granville, Ohio. He graduated at Doane Academy in the summer of 1892, and entered Denison University in the fall of the same year. He pursued the classical course and in 1896 received the degree of A. B. A year later he entered the Mechanics' Institute, Rochester, New York, and in one year completed the special course for teachers of manual training. Later, 1902-1903, he spent a year at Teachers College, Columbia University, New York City, completed the course for teachers of manual training in elementary schools and received the Bachelor's Diploma.

Mr. Bawden's teaching experience began at the Cedar Valley Seminary, Osage, Iowa, where, during the first year after graduation from Denison University, he taught arithmetic, algebra, United States history and French. After his year at Mechanics Institute he taught woodworking and pattern-making for a few months at the New York

State Reformatory at Elmira, and then, for four years, was a teacher of manual training in the public schools of Buffalo, New York. Immediately after graduation at Teachers College in 1903 he came to the Illinois State Normal University, Normal, Illinois, where he has built up a strong department of manual training and has helped plan and is now equipping a new building for work in science and the manual arts which will take its place among the very best in connection with state normal schools.

But his activities in Illinois have not been confined to the normal school. He was the first secretary of the Illinois Manual Arts Association, doing a most valuable service for that Association for four years. He gave up this office because he was asked to become secretary of the Western Drawing and Manual Training Association at a time when the Association needed his experience in reorganizing the work of that office. This in turn he gave up because he was appointed chairman of the Editorial Board of the same Association.

From time to time Mr. Bawden has presented papers on manual training to associations of teachers and women's clubs, and has contributed articles to magazines. His writings, especially his reports of association meetings, are too well known to readers of this Magazine to need mentioning here. Thoroness, breadth of view and professional loyalty have characterized all his work.

The General Industrial School We have been especially interested in the trend of the discussion of industrial education during the past few months. While the demand for public trade schools still continues, the larger aspects of the problem are coming to the front, and as they do so, it becomes increasingly evident that the greatest need is for some form of industrial education that is less specialized in character than that usually given in trade schools. It seems to be clear that "general industrial" schools would meet with less opposition from organized labor than trade schools, and would be more likely to receive the support of men of greatest influence in educational work. The school man's point of view is well illustrated in the following incident related by Superintendent Alfred C. Thompson of Auburn, N. Y., at the Chicago meeting of the Department of Superintendence:

In the early eighties a friend and companion of my youth announced his decision to learn the printer's trade and tried to persuade me to do the same. He argued that the demand for printing must surely increase; that the wages were good with excellent prospects of growing better, and that it would be a waste of his time to get any more general training when he could arrive at his goal so much quicker by applying himself at once to his specialty.

After a separation of over twenty years I met this friend last summer. He was looking for a job. He told me that he had worked at his trade for nearly twenty years before it was practically obsolete; that he was too old to learn to manipulate a typesetting machine with sufficient speed, and that since typesetting was the only thing he had ever learned, his predicament was most unfortunate. This is a typical case. It is a concrete illustration of too early specialization. The most practical education, in my opinion, is that which will teach children to think and make them versatile so that they will be able to adjust themselves to a changing environment. Any form of education whose chief aim is to teach trades at the sacrifice of academic work, will be disappointing in its results. Of this I have no doubt.

If it should be decided that the general industrial school would meet the greatest present need, a few fundamentally important questions will inevitably come forward: Must this general industrial training be given apart from the present high school or can this school be broadened and strengthened to meet this new demand? Are not the ideals behind the general industrial school identical with those behind a liberal high school? Is not the high school the place where the youth should find the general direction in which he should go in order to make the greatest success in life? and, Is it not the function of the high school to send him forward in his own direction whether that be toward the A. B. degree or the plumber's shop? Surely our American public high school of the twentieth century is not merely a college preparatory school, even tho it is still too often controlled by university men of a rather narrow type.

The Six-Year Elementary School But an expansion of the high school curriculum and a change in its atmosphere will not fully meet the present need; the change must reach down into the grades and must modify the subject matter and the time allotment of the elementary school. This has been recognized in many recent utterances on the problems of the elementary schools. Perhaps the most important proposition under discussion in this relation is that to condense the essentials of elementary school work into six years and provide the departmental

system of organization beginning with the seventh year of school work. Dr. Edward J. Goodwin, President of Packer Collegiate Institute, Brooklyn, in an address on "The Present Status of Public Education," before the last University Convocation of the State of New York, said:

> It is obvious that the giving of eight or nine years to elementary education must be abandoned. Ever since the report of the Committee of Ten in 1893 the conviction has been gaining ground among thoughtful school men that the program of studies for the elementary school should be revised and simplified and that a limited differentiation of studies should be provided for at the end of a six-year elementary curriculum.
>
> This differentiation of studies at the beginning of the seventh school year should be threefold. It should provide (1) shopwork adapted to the arts and products of industry, (2) suitable instruction in business subjects and (3) foreign language study for students preparing for the colleges or advanced technical schools.
>
> *Complete* differentiation in studies might possibly be postponed for three years, or until the end of the ninth school year. During these three intermediate years the three classes of students could be held together approximately one-half of each day for instruction in English, in history, in arithmetic with concrete geometry and algebra, and in the elements of biologic and physical science. It goes without saying that under such conditions the school day would be lengthened, and the syllabus of studies for these three intermediate years would have to be rewritten.

In a characteristically clear and thought-stimulating article on "Training for Vocation and for Avocation," in the December number of the *Educational Review*, Dr. Nicholas Murray Butler says:

> Vocational training ought not to be included in the six years that are sufficient for the elementary school course, properly so-called. The child is then too young to enter wisely and economically upon vocational training, and, moreover, every hour of his school life is needed for instruction in the use of the elemental tools and facts of civilization. He can, however, and should, then receive that preliminary training of his motor or expressive powers which, as has already been pointed out, is useful afterwards to build a vocational training upon.
>
> When once the six-year elementary school course is completed, however, then vocational training should be given its place. While every possible avenue of advance should be kept open for the boy or girl who looks forward to completing a general secondary school course, or to entering a college, vocational training should be provided for the vastly larger number who have no such purpose. They should be able to get the whole of a training intended for themselves, and not merely part of a training intended for some one else.

Such reorganization of the work of the elementary schools would be welcomed by every manual training teacher because it would place

his subject on the same basis as the others of the curriculum. It would give him a chance to utilize manual training in the grammar schools to somewhere near the full value. It would allow him to give to the children in these grades what he knows they ought to get out of their manual training and drawing work but what he is not able to give now because of lack of time. The cutting up of the time schedule into minute sections and then handing over a fragment or two to manual training is making a farce of manual training in many places. What can a teacher do with a class of twenty-five boys if he sees them but once a week and then for only one hour, during which time they must get out their tools and materials, receive instruction concerning the work of the day, perhaps make a sketch or drawing, and, after working a few minutes, clean up their benches and put away their tools and work in order that the next class may perform the same feat? With such conditions, how can any teacher expect to hold the interest of the pupils? How can he present the subject properly and carry the work forward to a reasonable finish. It is an impossibility, and the work under such conditions would have been pronounced a failure long ago, had it not appealed so strongly to the natural constructive interests of the children. It is such conditions that have been responsible for most of the criticisms that have been made of manual training in America during the past few years. We never find such conditions in England. There a period of two and a half or three hours is almost universal—a whole afternoon or a whole morning. We believe this difficulty is fundamental, and that it could easily be remedied in the proposed reorganization of the grammar school work. Then the manual training teacher with the increased time at his disposal and an enlarged ideal before him could bring about real results in the direction of industrial education that are impossible in most grammar schools at the present time.

An Englishman's Criticism

Apropos of the return of the United States exhibit from the International Art Congress in London last year, it may be of some interest to notice the comments made upon it when shown in the city of Leeds. Perhaps these will help some of us to realize more fully the truth in the statements of some of our American leaders in art education: that we need to give more attention to thoughtful, accurate drawing; that we should not be afraid of placing

emphasis upon some of the same old principles we were taught; that only thru such drawing can our pupils acquire facility in using drawing as an adequate means of expression. There is no other royal road.

The catalogue of the exhibit in Leeds contains the following statement:

> In the United States drawing is evidently regarded as a study which should be developed in its relations to other subjects, hence the knowledge obtained in drawing is applied at an early stage to constructive work, design being taught from a thing actually made. The exhibit strikes one at a glance as being the work of a foreign nation, and on closer attention it will be found that the characteristic of the work is strength in technique. The drawings are evidently executed at great speed, with the result that the pupils can handle color very well, but the expressions are more suggestive than real, betraying a great lack of accurate drawing. This is a decided weakness and is in marked contrast to the accurate representations in similar studies throughout the English section of the exhibition. Drawing and painting with technical ability as its only aim is of no educational value.
>
> The method of laying on color is one which should not be attempted until the pupils have been taken through the preliminary and necessary stages of study which in this exhibit are apparently absent.
>
> The broad statement can be made with regard to the exhibit that the pupils have not been taught to draw accurately. Genuine study of underlying principles with regard to form and color has not received the attention it should have had.

—C. A. B.

Art in the Wood-Working Class Comparatively little consideration has been given to the posibilities of the manual training wood-working class as a means of developing artistic expression and of cultivating good taste and appreciation of what is beautiful and appropriate in the simple utilitarian and decorative objects that surround us in our daily life. The art department in the public schools has offered very little that is suggestive to the wood-working teacher, largely, it is probable, because of the limitations set by constructive features with which art teachers in general are unfamiliar. The efforts of the art class as applied to wood have been confined principally to the decoration of surfaces, and the results have often been inappropriate.

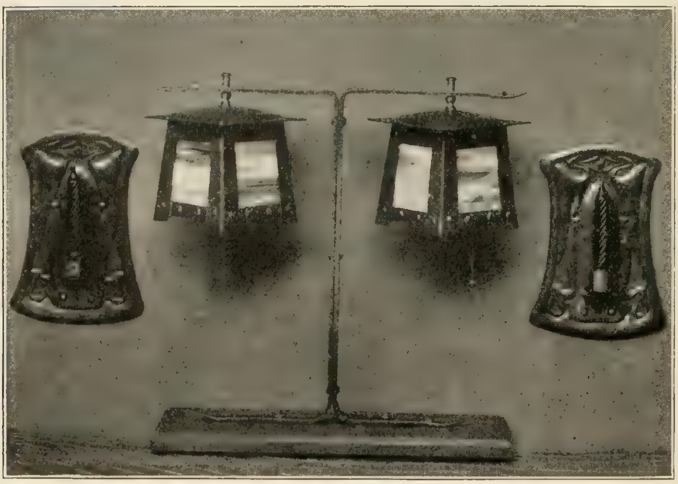
Art appreciation as a development of manual training was impossible while manual training teachers were hampered by the traditions of exercise courses, and while emphasis was placed almost wholly upon the technical use of tools and materials. Manual training teachers too,

were practically without art training and had but little understanding of what was good in design. With the recognition of the fact that art training is essential to the manual training teacher, and the recognition of the right of initiative on the part of the pupil in the selection and design of his project, new opportunities are revealed, which were impossible so long as courses were arbitrarily arranged and designed by teachers who subordinated all else to the sequential arrangement of tool exercises. The products of the manual training class have at least one important claim to the best that can be produced both in workmanship and beauty. They have permanence and consequent value due to the very nature of their material and construction.

Several applications of art principles to woodwork are obvious. Outline, proportion, the decorative use of joints, surface decoration, and color, with certain limitations, are all within the province of the woodworking class. To illustrate by simple projects that are within the capabilities of pupils of the grammar grades, the shelf or bracket problem presents an unmost unlimited variety of uses from which to select a project involving a study in artistic and appropriate outline in straight lines or curves. In connection with the box problem choice can be made among the large number of uses to which the box may be put, anyone of which presents an excellent problem in proportion, not only in length, width and height, but in thickness of material, extension of top and bottom and in the simple mouldings. The joints and supports used in simple construction present a great variety of opportunity for simple and appropriate decoration. Surface decoration either in color or simple carving has a limited application in such problems as the box and the book rack end, but in general is rather to be avoided. The material may often be so selected that the grain of the wood well serve as a decorative feature. Color has its application in the use of stains and finishes, where colors should be chosen which will harmonize with the surroundings in which the project is to be placed or with the thing for which it is designed. A good example of the use of color is shown in the simple picture framing problem illustrated in the frontispiece of this issue of the Magazine. In this problem the reverse of the usual manual training order of procedure was followed. The picture was taken as the basis of the problem. The construction lessons were preceded by a class discussion of pictures and picture frames illustrated by examples. This discussion brought out the fact that beautiful pictures could be found that were inexpensive, such as the color illustrations in magazines and

even the illustrations of many advertisements, and further, led the pupil to distinguish between the good and the crude. The pupil then brought a picture of his own selection from home which was studied in relation to style and width of frame. A frame was drawn and cut from paper so that relations might be studied and changes made if necessary. An appropriate wood was chosen with close or open grain as demanded by the detail of the picture, and the construction lessons followed. Finally the frame was finished in color to harmonize with the picture.

The advantages of this simple applied art are manifest. Efforts in this direction would be more than justified, solely on the ground of added interest in the work for both pupil and teacher. —W. E. R.



ARTS CRAFTS—COLUMBUS, OHIO.

ASSOCIATIONS

William T. Bawden, Editor.

NORTH CENTRAL ASSOCIATION.

The North Central Association of Colleges and Secondary Schools held its fourteenth annual meeting in the banqueting room of the Auditorium Hotel, Chicago, March 26-27, 1909. The attendance was larger than ever before in the history of the Association, universities, colleges, and secondary schools in a dozen states from, and including, Ohio to Colorado, being represented.

The program included the address of the President, E. W. Coy, Cincinnati, Ohio; a paper upon "The Small College: Its Place and Its Work," by President A. T. Perry, Marietta College, Marietta, Ohio; a Report of the Commission on Accredited Schools, some six hundred in number, by President George McLean, University of Iowa; a paper upon "Intellectual Hoboism," by Dean J. O. Reed, University of Michigan; and a paper by Charles F. Perry, Director of the Milwaukee School of Trades, Milwaukee, Wis., from which the following extracts are taken:

THE PUBLIC TRADE SCHOOL.

"There are three ways a boy may learn a trade to-day. First, by an apprenticeship in a commercial shop; second, in a private trade school; and third, in a public trade school. The first method, while not altogether obsolete, is nearly so excepting in plants where they have made a study of the problem and solved it satisfactorily to the employer and the limited few who are fortunate enough to be chosen from the waiting list and who complete the course. The second way, also, at best, can reach but a few pupils unless the charges made are for the cost of the material only. To charge a student the cost of his apprenticeship in a trade school which is conducted solely in the interest of the boy means to debar the very pupils who desire to and who should attend. The likelihood of the establishment of many first-class private trade schools is small. Philanthropists will prefer to endow schools of higher learning—schools which would be less liable to be established by a public tax. The third way, the public trade school, will be found to be the natural and best solution to the problem.

"Including those who leave school when the law says they may and those who leave at the end of the eighth grade, there go annually out into the army of earners approximately seventy-five per cent of our boys. But a small per cent of this number are over fifteen years of age. Even though the United States had the best system of trade schoools in the world they would be of little help to boys who persist for any reason in leaving school at fifteen years of age.

"Before discussing the main lion in the way let me assure you that the right trade school can thoroughly perform its function, which is to turn out thoroughly prepared apprentices. It can take a boy at sixteen and in one-half of the time required in a commercial shop teach the boy as much and frequently more and in

a better way than he could learn in four years under commercial conditions. It can be plainly shown to anyone who cares to look into the matter and who can appreciate the entire premises that the trade school graduate who began his apprenticeship at sixteen can by twenty years of age be made better fitted in every way to meet life than the commercial apprentice who began at sixteen.

"Accepting this as true our next problem is to find what obstacles are in the way to prevent all those who would become skilled workmen from becoming so. More than rich is the youth who lives in a country which offers him the opportunity to start at twenty well equipped for practically anything to which his ambition may lead him. That there are obstacles in the way is only too evident. They cannot all be traced to one door. It will be found that they lead either to the boy, his parents, the school system or industrial conditions. Our elementary schools can never be made to make all boys complete the eighth grade especially in the face of a law which says they may leave them at fourteen. There are some boys who have not the mental caliber to complete the eighth grade even at sixteen, but who will make splendid mechanics. We have boys who could complete the eighth grade if they only would, but they want to be at work—some from the call of the dollar at home but many simply from inability to apply themselves to their school work. It is irksome. The public school system has nothing which appeals to them beyond the eighth grade and, since if they did complete it they would go to work then, they take advantage of their legal rights and enter the ranks of the earners at whatever age the law says they may. Then we have the boy who would like to go to the trade school just as soon as he gets through the eighth grade but the law says he must wait till sixteen. This classification could be continued still further—what can we do for all of them? Simply make our public instructional system worth while attending until the boy or girl can go out equipped for that work which he or she feels born to do. Because the law says a boy may leave school at fourteen we must not wash our hands of him and say we have done all we could—the harvest is his. Not yet. We must on the one hand vitalize our elementary grades so that boys will gladly longer stay in them and on the other hand have something ahead for them, something better than they can get anywhere else. Let them see other boys getting it and if our problem is not wholly solved we will be at least half way toward our goal.

"We cannot have much change in our elementary schools until our normal schools awaken to the realization of their wonderfully strategic position and use it to its fullest limit. We must go even further back—to the writers of our text books. A different censorship is needed for them. They should be made to pass the criticism and receive the endorsement of educated business men and women interested in education. When every subject which is taught in the graded schools has been subjected to a severe cross examination as to its right to be there and how much of it should be taught and how taught we have added another long stretch toward our goal.

"Next the influence of the trade school should be used in bridging the fatal gap between fourteen and sixteen years of age. First it should care for the boy who stayed in the graded school long enough to graduate from it. Many of

them would prefer to go at once to work but when they see that the employer would prefer a graduate from a trade school to any other young man and since they can have served a thorough apprenticeship by eighteen years of age they wisely choose to wait until sixteen to begin the trade school course. What will the boy do in the meantime? He cannot better spend that time than in a trade school preparatory course, a course which will give him considerable shop work in wood, and elementary work in metal, some mechanical drawing, some workshop mathematics and some business English. If possible, this should be done in the environment of the trade school. The boy would like it better there and it is the next best thing to what he wants. These preparatory departments will come later. For the present a practical solution lies in adding another course to our high schools, or slightly modifying the regular manual training course in those institutions so as to give the boy the subjects just mentioned. With practically the same equipment and teachers this preparatory work could be done and many boys saved. Let the course be such that the day the boy is sixteen he may leave it and go to the trade school. In the interim some boys who thought they wished to learn a trade will find they now desire some other life work. If so the ground covered will count as high school credit and no time has been lost. Money will be saved to the city because the boy under sixteen cannot grasp the work of the right trade school. Some high school principals will object to this preparatory course in their schools because it will congest their lower classes. It is conceded to be not the ideal plan but in the hands of the principal who is eager to help every boy he can he will make it work and thus hasten the time when the regular trade school with its own preparatory course will be established.

"This briefly is what the public trade school may do, with much left to be considered in detail. Some educators will criticize the specialized trade school. They claim it will ruin the democracy of these United States to introduce class education. It will need separate schools and the segregation begins too soon. Will raising the efficiency of each individual in the entire community cause a disintegration of our democracy? This country to-day is seriously in need of "First Aid," industrially speaking. It will take several years yet to awaken public opinion to the degree it should be to give industrial education its proper place in our public school system. The trade schools of Germany and throughout Europe are held up to us as an example to follow. We may appoint a commission to go to Germany and gather the cream of her experience of thirty years of public school vocational teaching. The commission may return with her identical curriculum, it may bring even her machinery and tools and teachers, but whatever it may gather and bring, the most vital and necessary thing—Germany's public opinion toward trade teaching—must be left behind. We must develop our own just as she did. We must bear in mind that the youths in the trade schools in Germany to-day are the children of parents who themselves have the trade school to thank for their skill. Another important point—Germany did not start her trade schools in the face of such keen industrial competition or specialized manufacture as that in which we are compressed to-day.

"A boy who is sixteen years of age and a graduate of the eighth grade may, if necessity compels him, end his academic work for a time and prepare for actual

life in a trade school. The right vocational institution will by no means teach shop work only. It will teach him mechanical drawing and workshop mathematics. It will take him on shop inspection trips and make him prepare written reports on these trips. It will give him lectures on topics pertaining to his trade and trades allied to his. It will suggest to him correlated reading. Our country is awakening to the value of night schools of both grammar and high school grade. Trade papers and journals are giving us what the hungry workman wants and in a form that he can readily grasp. Correspondence schools will help many, and now last and best of all for those whose academic school days are ended we are having university extension brought to our homes and supplemented by the personal instructor.

"How can the public opinion of this country be awakened as quickly as possible to the value of industrial education? Nothing will develop public opinion so quickly as tangible results. Each city may start its trade schools quietly and on a small scale. Show results that will win the commendation of the most skilled workman and employers in the trade in question. Have the superintendent of schools of the city issue a schedule to each district school principal authorizing him to take all of his seventh and eighth grade boys to the trade school and spend an afternoon there. Before leaving the building a talk should be given the boys on the importance of being equipped for life in the best possible way. He need not be urged to learn a trade. It makes little difference what we choose for our vocation in life providing we *find ourselves* and, "blessed is the man who has found his work." Give each boy an illustrated catalog descriptive of the work of the school and answering all the questions he is liable to ask about it. Tell the boys to share this pamphlet with their parents and send an invitation to them to visit the trade school. Let all the other teachers in the city be instructed to and given time to visit the trade school. Lastly the manufacturers and business men must be made intimately acquainted with it. Thus we have reached the boys, the parents, the teachers and the employers.

"Instruction in public schools is free in most states until twenty years of age. Thus it is possible in that system for a boy, if he desires and has the ability to complete his high school course by eighteen, still to have two years left for him to take his complete trade school course free. Not until we have the best possible vitalized elementary courses taught by properly trained teachers, who have had impressed upon them the important truth that they form a unit in an unbroken whole which leads from kindergarten to either vocational, business or professional life, will we be able to expect or have any right to expect to hold our boys and girls longer than we do. Nor will it be sufficient to have all this alone. In a careful way our children must be led to know what a wonderful birthright is theirs."

The Association favored in Colleges of the Liberal Arts the admission of semi-professional studies during the senior and junior year, with a view to shortening somewhat the time absolutely required by those who secure a degree of Bachelor of Arts and also a professional degree. The Association extended the range of subjects under the Manual Arts to include the Mechanic Arts, Mechanical Drawing, Household Arts and Sciences, such as Needlework and

Cooking, Freehand Drawing and Applied Art, covering, all told, 12 units of work, the same to count for graduation from the high school and recommended for places among the elective studies required for admission to colleges and universities.

Following is the definition of units in Freehand Drawing and Applied Arts adopted March 27th, 1909: Hour basis for Credit—(2 units)—240 hours for each credit.

Approximately one-third the time should be given to representative drawing and two-thirds to decorative composition, constructive and decorative design, construction and applied design.

a. *Pictorial.*—Plant study (flowers, sprays of leaves, seed pods, etc.); object study (perspective); landscape—roof studies, buildings, etc. (perspective); pose drawing; composition.

b. *Decorative Composition.*—Plant forms, object study, landscape, pose.

c. *Decorative Design.*—Plant analysis (for the purpose of design); conventionalized plant forms; decorative units, borders, surfaces, corners, rosettes, posters, book-covers, etc.; stencils—wood block printing; historic ornament; arrangement of straight lines, and of straight and curved lines; geometric design; lettering (printing), illuminating; schemes for interior decoration.

d. *Constructive Design.*—Designs for pottery, leather, metal, book-binding, furniture, cardboard construction, textiles, etc.

e. *Crafts.*—Pottery, leather, metal, book-binding, furniture. (Choice of one or more of the above crafts.)

f. *Applied Design.*—Design applied to the crafts and to cardboards, textiles, etc.

g. *Illustration.*

h. *Talks on history of Industry and Art,* on civic planning, domestic architecture and decoration.

i. *Instrumental Drawing* to be given as needed to meet the requirements of practical designing and construction.

Note.—Mediums used: Pencil, charcoal, water color, crayons, brush and ink and a combination of the pure mediums.

While declining to go into any discussion upon a question of the propriety of admitting professional athletes to play in inter-collegiate contests, it reaffirmed its previous declaration in favor of amateur athletics and the faculty control of inter-collegiate schedules.

The following officers were elected for the ensuing year: President, Dean Calvin M. Woodward, Washington University, St. Louis, Mo.; Secretary, Dean Thomas A. Clark, University of Illinois, Urbana; Treasurer, J. E. Armstrong, Principal Englewood High School, Chicago. The Association will hold its next annual meeting in March, probably at the same place.

CENTRAL ILLINOIS TEACHERS' ASSOCIATION.

The twenty-fifth annual meeting of the Central Illinois Teachers' Association was held at Decatur, Friday and Saturday, March 19th and 20th, 1909. The general verdict of those who were present was that this was one of the

best and most profitable meetings of the Association ever held. It was also one of the largest in attendance, being surpassed only by the big meeting which was held at Bloomington a few years ago, when the attendance reached the 2,000 mark. The attendance at the Decatur meeting was over 1,300.

By vote of the Association two of the addresses are to be published, and mailed to members. They are: "The Educational Progress of the Quarter Century," by Pres. David Felmly, of the Illinois State Normal University, Normal, and the report of the committee on "Training for Citizenship," by Supt. W. A. Furr, Jacksonville, President of the Association.

The program of the general session contained four other unusually strong addresses as follows: "Religion and Moral Education in Public Schools," by Dr. T. G. Soares, University of Chicago; "A Rational Fight for Character," by President H. C. King, Oberlin College, Oberlin, Ohio; "Higher Levels of Efficiency," by Dr. Luther H. Gulick, N. Y.; "The Teacher as a Prophet," by Dr. Edward A. Steiner, Iowa College, Grinnell, Iowa.

One of the topics at the primary and intermediate section was "The Handwork of the Elementary School," by Edward F. Worst, Chicago Normal School, with discussion opened by Miss Emma G. Olmstead, Teachers Training School, Springfield. The program of the high school section contained a paper on "Vocational Training," by Prin. G. H. Wilkinson, Jacksonville.

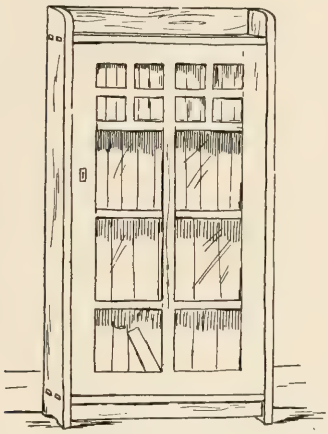
The Association received an urgent invitation to hold its next annual meeting in the new Auditorium at the State Normal University, at Normal, and although the matter was not decided, it is thought probable that the invitation will be accepted. The following officers for the new year were elected: President, George H. Howe, Dept. of Mathematics, State Normal University, Normal; Vice-President, Supt. G. P. Randle, Mattoon; Secretary, Mrs. Eva B. Batterson, Petersburg; Treasurer, W. N. Brown, Peoria; Railroad Secretary, Warren Taylor, Springfield; Executive Committee, C. H. Watts, Urbana, Chairman; G. T. Gale, Beardstown, and H. H. Edmunds, Clinton.

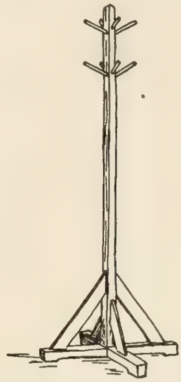
SHOP PROBLEMS

GEORGE A. SEATON, Editor.

BOOK CASE.

In harmony with some of the furniture designs contributed to recent numbers of the MANUAL TRAINING MAGAZINE by William E. Roberts of Cleveland, is the bookcase shown this month. This also is by Mr. Roberts. The main





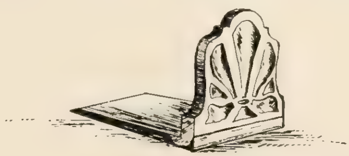
dimensions alone have been indicated and the others may be varied to suit conditions. The door which is shown may also be omitted should the maker be lacking in the necessary time or skill.

HALL TREE.

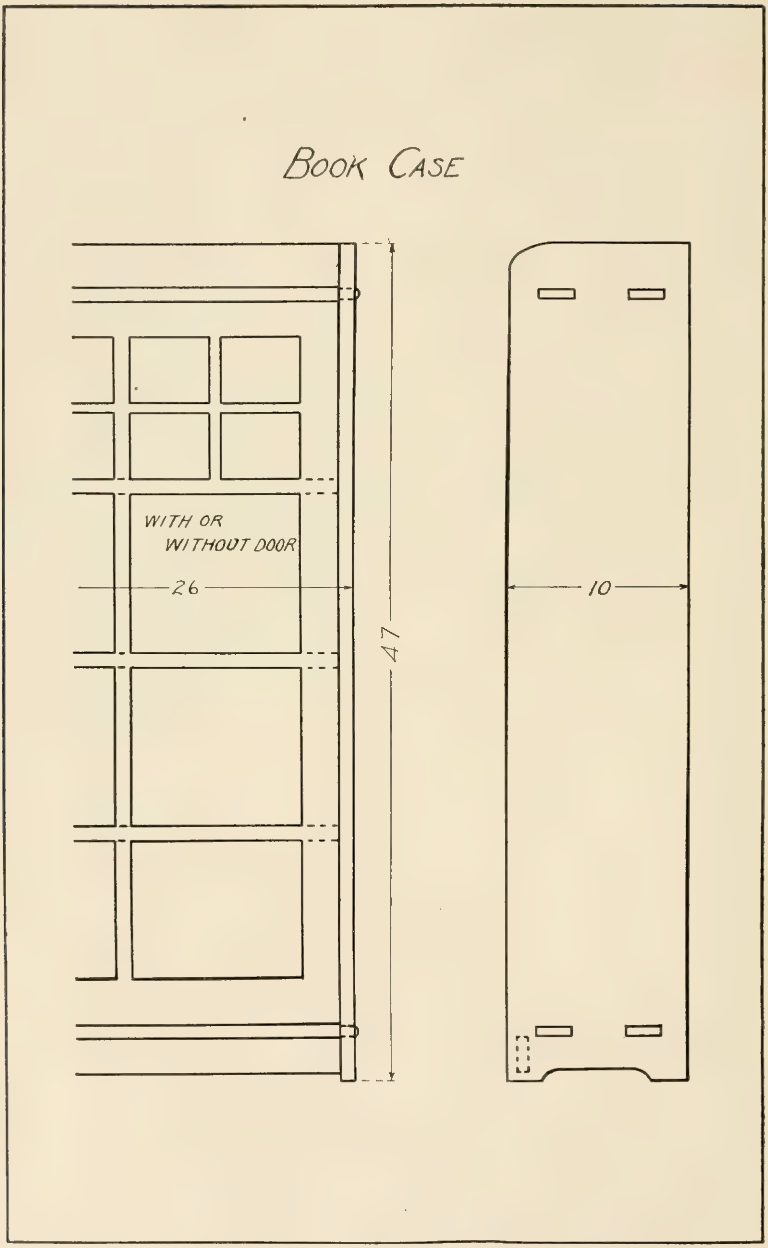
The drawing for the hall tree or costumer which is given this month is from Hans W. Schmidt of St. Paul. As suggested in the note on the drawing, the hangers may be either of metal or wood. Perhaps the wooden pegs may appeal as being more in harmony with the design, though metal hangers are apt to prove more practical.

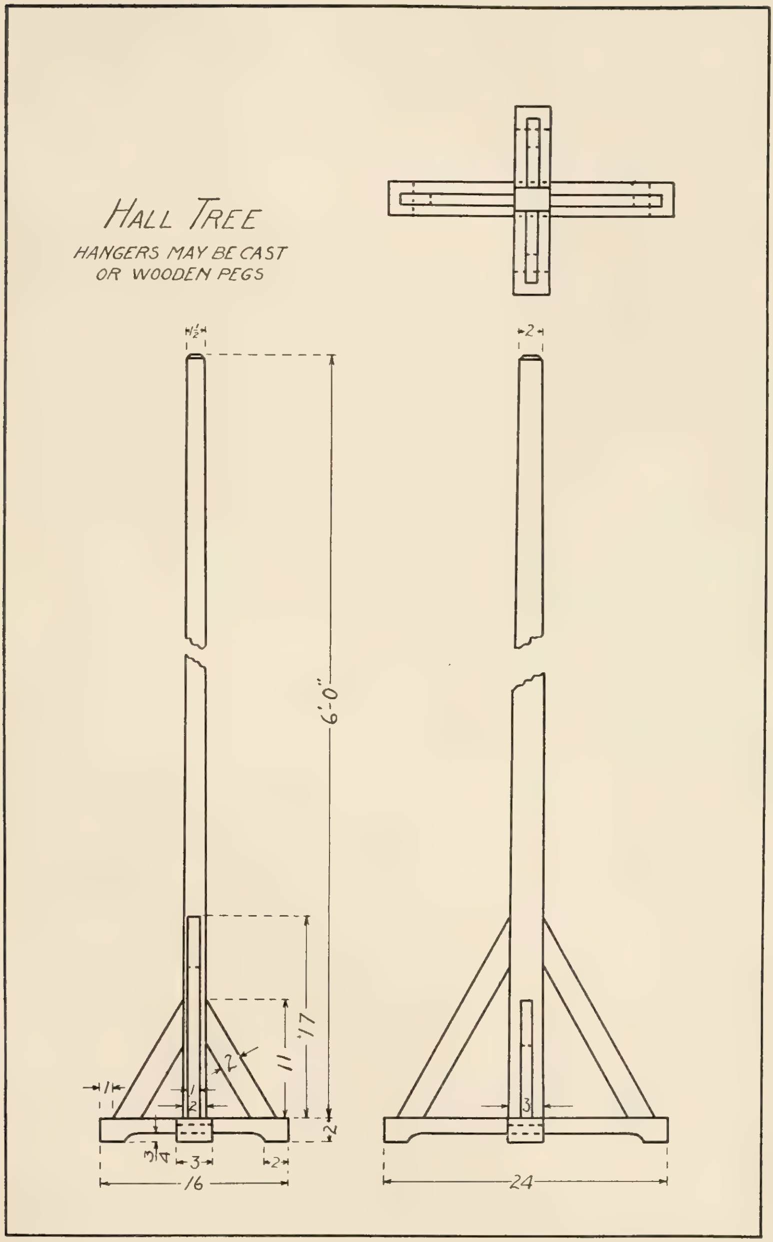
FOLDING BOOK RACK.

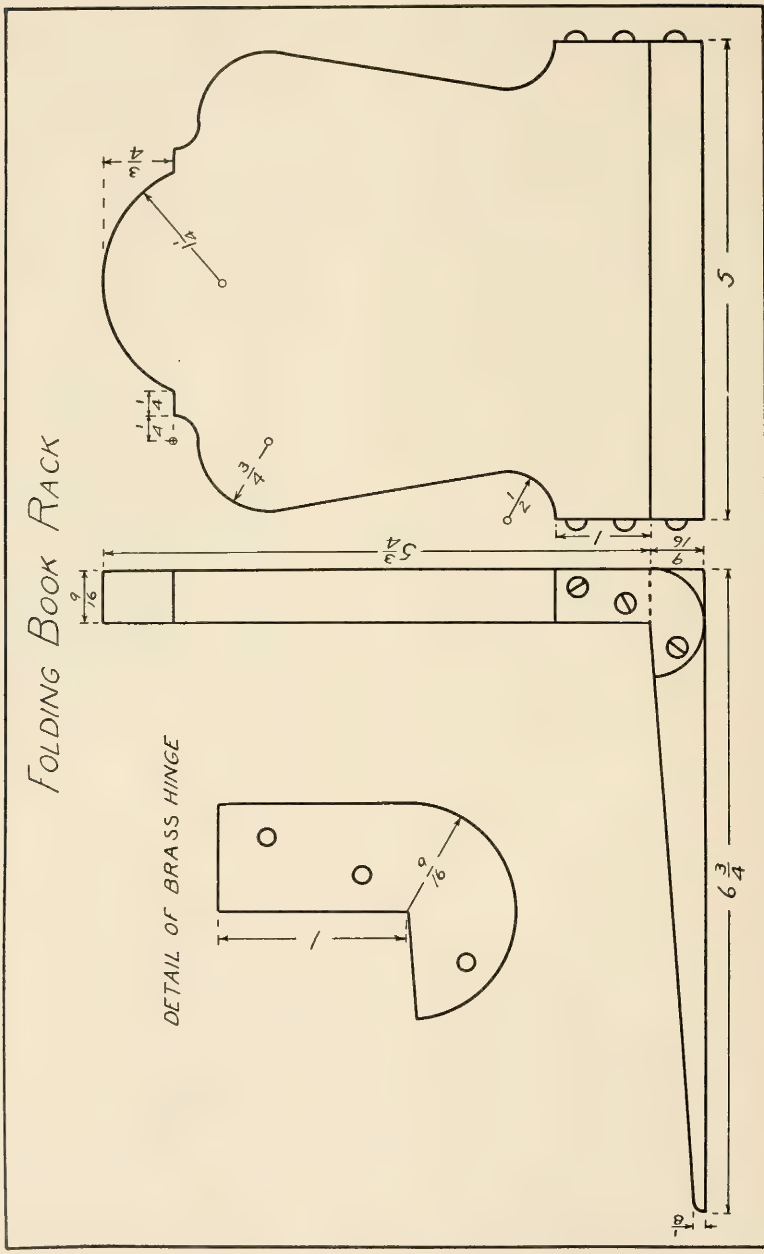
A design that appeals because of its ingenuity is the folding book-rack sent in by Frederick B. Riggs of Santee, Nebraska. The hinge which is cut from

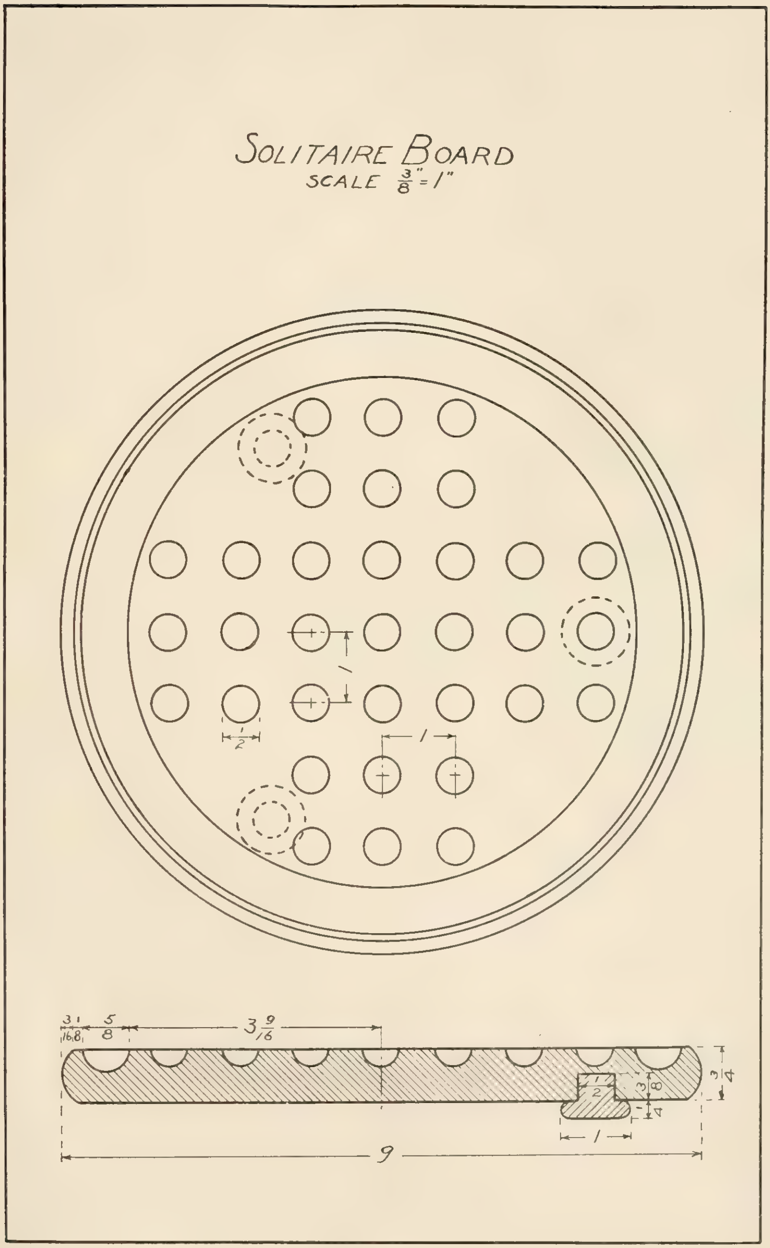


26 gauge sheet brass makes it possible to fold the rack into compact form for traveling. The hinge is put on with ¾-in. No. 6 round head brass screws.


BOOK CASE
WITH OR
WITHOUT DOOR
26
47
10

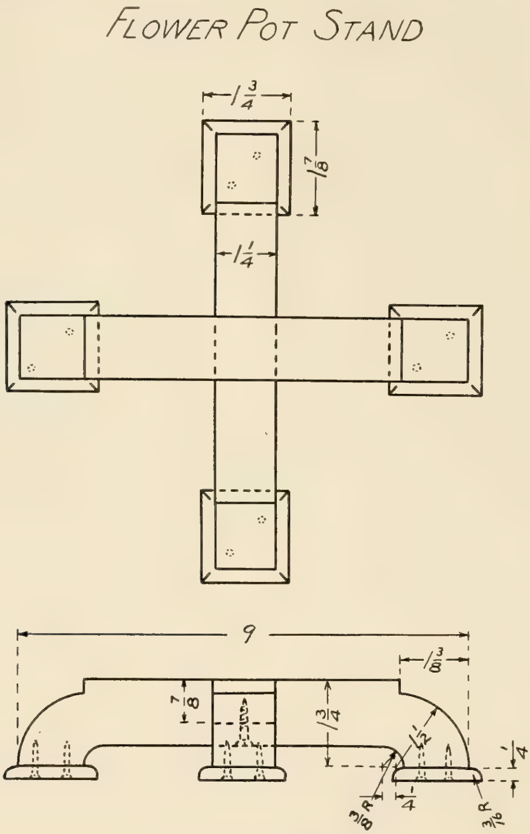

HALL TREE
HANGERS MAY BE CAST
OR WOODEN PEGS
1½
2
6'-0"
17
11
2
1
1
2
3
2
3/4
3
2
16
24


FOLDING BOOK RACK
DETAIL OF BRASS HINGE
5
6 3/4
5 3/4
9/16
1
1 1/4
3/4
1/2
1/4
1/8


SOLITAIRE BOARD
SCALE 3/8" = 1"
1
1/2
1
3/16
1/8
5/8
3 9/16
1/2
3/8
3/4
1/4
1
9

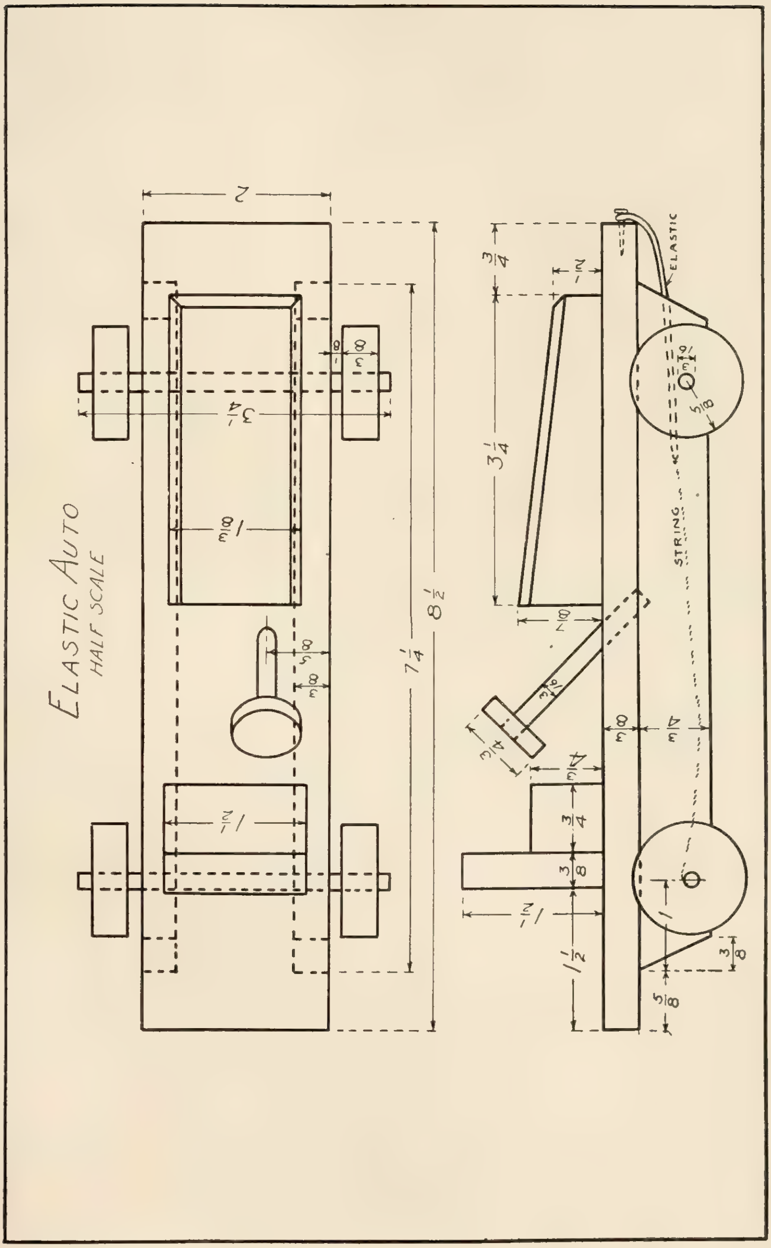
FLOWER POT STAND.

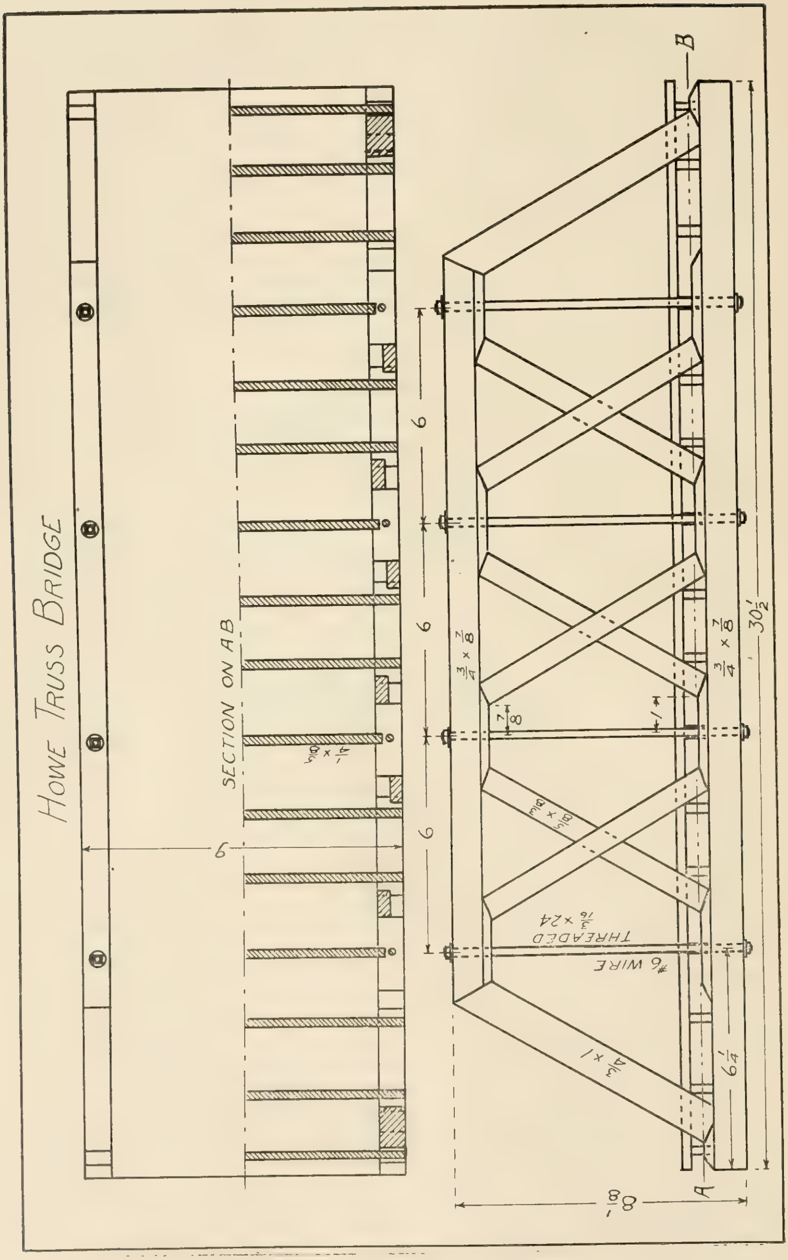
A. P. Ball of Worcester, Massachusetts, suggests an interesting modification of the familiar sloyd model in the flower pot stand shown. The few added curves give a lightness to the appearance though of course they increase the difficulty of construction.



SOLITAIRE BOARD.

This is a problem which has been worked out with interest in the wood-turning classes of East Cleveland. The problem was undertaken before any satisfactory method of producing the thirty-three hemispherical holes had been discovered. Numerous drills were fashioned, and the hardware stores were ransacked without results. Possibly a better equipment of metal working tools might produce a better drill than that which was finally adopted. A large screw having a round head ½ inch in diameter was filed with a series of grooves until it somewhat resembled a rose-head countersink. This was then used in a drill chuck in the lathe, and though it was found impossible to give it a temper, the same


ELASTIC AUTO
HALF SCALE
ELASTIC
STRING


HOWE TRUSS BRIDGE
SECTION ON AB
THREADED
#6 WIRE
A
B

drill has been in use successfully for two years. The board is used for a solitaire game. All the holes except the center one are filled with marbles which are then put in play. Jumps may be made as in checkers along straight lines and the marbles jumped are placed in the groove running around the board. The object of the game is to have the last marble left in the center.

UMBRELLA RACK.

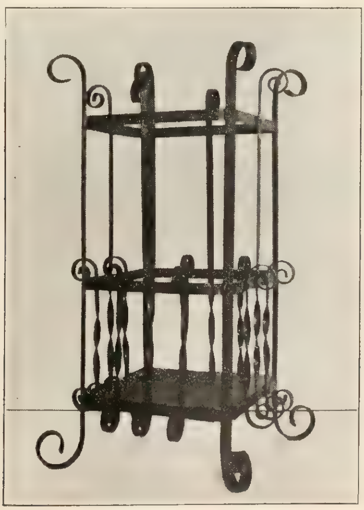
E. H. Masters of South High School, Cleveland, sends another problem in forging which is but one of the possible solutions for an umbrella rack.

ELASTIC AUTO.

A toy that has met the enthusiastic approval of a number of boys about ten to twelve years of age is the elastic auto of which a drawing is given. Henry F. Pease of Newark, N. J., suggests that the boys will appreciate a finish of bright red with trimmings of black. The wheels are cut from 1¼ in. curtain poles and the steering wheel from a ¾ in. dowel rod. Some of the boys will be quick to discover where additional improvements can be made. A strip of ⅜ in. Venetian iron can be bent to form a combined step and mud guard. A trunk and a spare wheel can be attached behind and a long wire nail can be bent to form a crank at the front.

HOWE TRUSS BRIDGE.

A miniature bridge of exceedingly simple construction but of ample strength forms one of the problems used by Hans Schmidt of St. Paul. The tension members are made from No. 6 wire, while the compression members are formed of wooden strips ⅜ by ⅝ inches.



LIVING ROOM FURNISHED AND DECORATED BY PUPILS OF THE SEVENTH AND EIGHTH SCHOOL YEARS. CRAFTS EXHIBITION, NEW YORK CITY, FEBRUARY, 1909.

CURRENT ITEMS

CLINTON S. VAN DEUSEN, Editor.

Changes in positions of teachers of the manual arts will be a special feature of this Department in the October number. Readers are invited to notify us of such changes not later than August 25th, giving details of general interest.—ED.

NORTH ATLANTIC STATES.

From an examination of the proof sheets of the Third Annual Report of the Commission on Industrial Education for the State of Massachusetts it is apparent that the Commission is doing a large amount of work and that their work is bearing fruit. By act of the Legislature the term of the Commission has been extended from three to five years; that is, until August, 1911. There has also been added a sixth member to the Commission in the person of Miss Emily G. Balch. The Commission feels that the policy on which it has been working is sound and it is extending and developing its work along the lines of its previous work, but at the same time it is still further investigating conditions and compiling information that will be helpful in the future development of the great work it has begun. Especial attention is being given to industrial education for girls, which presents even more difficulties than that for the boys on account of the double aim in the education of the girls, who need to be prepared both for home life and also for an occupation which will provide for self-support. The report contains a large amount of information bearing on industrial education.

BOSTON.

Boston is to have a World's Fair in 1920 in commemoration of the three hundredth anniversary of the landing of the Pilgrims and the founding of New England. Eleven years' notice ought to give sufficient time to prepare for such an event and we shall expect that education will be given a prominent place in an exposition in Boston.

Announcement is made of the resignation of Walter Sargent as director of drawing and manual training. Mr. Sargent goes in June to the Chicago University to organize a new department. He will be Professor of Education in Relation to Art and Manual Training.

There was recently held in the rooms of the City Club, an interesting exhibit of the work done by the Evening Industrial School, of which Frank M. Leavitt is principal. This exhibit included drawings from life and costumed model, composition and illustrating, mechanical and freehand drawing. Other subjects included in the curriculum, but not forming a part of the exhibit, were ship drafting, steam engineering, and machine shop practice.

The new Edward Everett School in Dorchester, now nearing completion, contains modern rooms for manual training and cookery.

The new school being built to replace the Winthrop and Brimmer Schools, for girls and boys respectively, will be one of the largest in the country, and will have some unusual features, such as open air class room, infirmary, etc. It will, of course, have manual training and cookery rooms.

The Eliot School, Jamaica Plain, closed its season with an exhibit of work in wood-carving, joinery, art metal work, design, and mechanical drawing. The courses also include algebra, practical geometry, and trigonometry.

PUBLIC SCHOOL WORK IN THE MANUAL ARTS EXHIBITED IN NEW YORK CITY.

A unique exhibit of public school work in the manual arts was held in the hall of the Board of Education, New York City, February 15 to 20. The work shown was gathered at the end of the fall term, no previous notice of the exhibition having been given to the teachers. On this account the specimens of work shown represented the ordinary products of the class teaching as it is going on every day in the schools of the city. Only ten days were given for all the preparations.

The chief feature was the furniture, most of which was made by the pupils of the eighth grade. For this work the school furnishes the wood for the smaller projects, but if a boy wishes to make a large piece he is required to furnish the wood himself. One class in an east side school in the heart of the Jewish neighborhood completed nearly thirty different furniture projects during the fall term, the wood for which was purchased by the boys at a cost of $80—a triumph for enthusiastic teaching. It must be understood, however, that not all of this work was done in the regular schedule time of eighty minutes a week. Many of these larger projects required additional time which was given after school hours.

In addition to the furniture shown in the exhibit there were many examples of bookbinding and portfolios made by the girls' classes of the sixth, seventh, and eighth grades. There was also work in freehand color drawing in crayon and chalk by both boys and girls, and freehand working drawings.

During the exhibition, groups of children were constantly kept at work illustrating the processes shown by the work on the walls or the exhibit tables, one corner of the exhibit room being fitted up as a shop. Thus were illustrated the processes of (a) woodworking, (b) repoussé and thin metalwork, (c) bookbinding, (d) stenciling and block-printing, (e) monotyping, (f) freehand drawing in colored chalks, (g) designing and (h) making working sketches. The work done during the exhibition was passed out to the visitors or hung on screens behind the workers.

The decorated rooms shown in the accompanying photographs were built in one side of the exhibition hall. The walls were made of light studding covered with linen or canvas. The dining room was in red, the library in gray green, and the living room in light brown. None of the furniture in the rooms had been made especially for them. All pieces were taken from the general collection of projects sent in by the shops. Everything in the rooms, save the rugs upon the floor and the big poster picture above the library mantel, was the work of the pupils of the seventh and eighth grades. Curtains, pillows, furniture, lamps, pictures, books—even the toys were made by the pupils. Each room represented the contributions of between forty and seventy-five children.

In this connection we quote from a statement concerning the exhibition made by Sir Caspar Prudon Clarke, director of the Metropolitan Museum of Art, because his point of view should be of interest to all teachers of the manual arts. He said:

LIBRARY FURNISHED AND DECORATED BY THE PUPILS OF THE SEVENTH AND EIGHTH YEARS. CRAFTS EXHIBITION, NEW YORK CITY, FEBRUARY, 1909.

"It was all very interesting. This training is a good thing for the boy whether he will use it in after life or not. It gives him a distinctly different point of view, a sense of appreciation not possessed by the child who has never been so taught. As a training it serves to raise the standard of public taste, and all those engaged in teaching should strive to do this. A country's art to develop needs a people with artistic feeling; the art plant in other words, must have a nice soil in which to grow. This work of the schools needs much to make conditions right for this growth.

"It is well to have the work move along the lines of design rather than pictorial art. In England the tendency amongst art students was to take advantage of the training given in the schools of design and technical schools, in order to acquire drawing and color. They then forsook the technical training and devoted the whole time to picture painting, partly on account of the supposed higher social status awarded to the artist, and the gambling chance of higher profits. The government had considerable difficulty in trying to stop this wholesale manufacture of cheap artists.

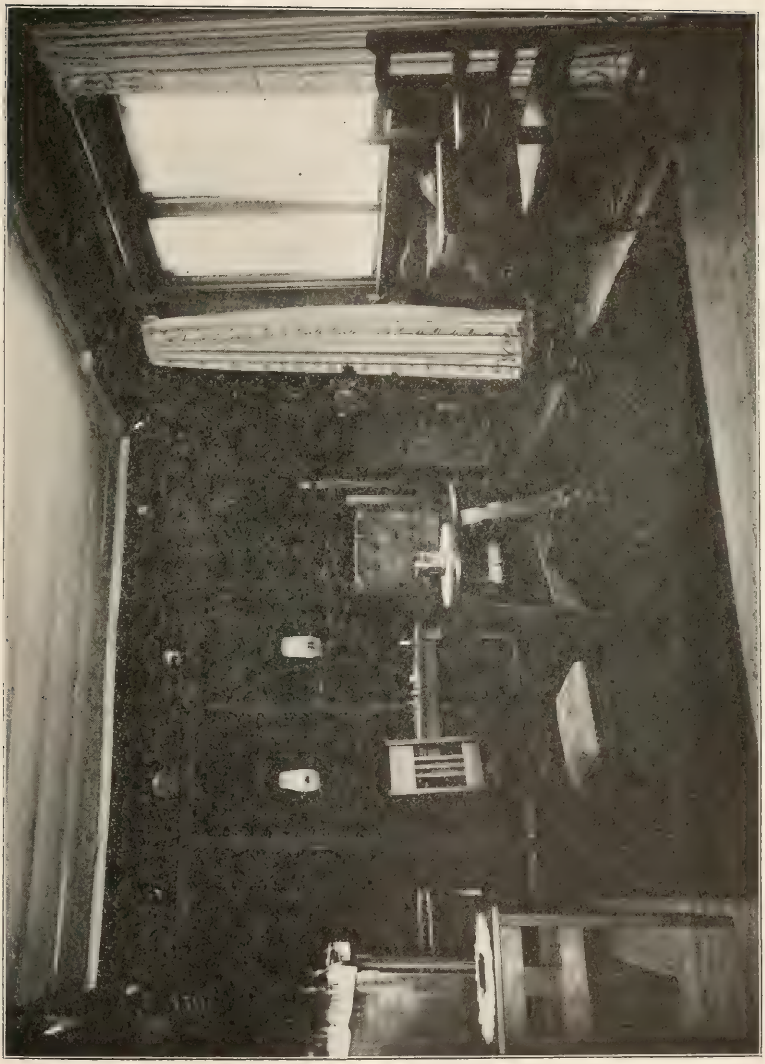
"It is not possible to force all the pupils to be artists, pictorially. Design, however, gives abundant opportunity for creative work, and it has besides a wide range of application which makes it useful in a hundred trades. I noted moreover that the color of these pupils' patterns was kept quiet and subdued. This is wise. The tertiary tones, the softer browns and greens are far more easy to combine in harmonious arrangement than are the more intense primaries. The advantage of these quieter tones was especially shown in the rooms decorated by the children.

"It was a good plan to show in these rooms how varied is the application of the pupils' work. To many of the school pupils they showed for the first time the things they had made in their appropriate surroundings. They saw how their curtains and cushions, their freizes and pieces of furniture should look when properly gathered together with consideration of the pattern and color scheme of the room as a whole. They learned too from them far more forcibly than from mere telling that the designer should always seek to decorate construction, and should never essay to construct decoration; in other words that he should make his patterns appropriate to the objects decorated and not assume that the constructed form is simply a basis made for him to exploit with all kinds of eye-varying ornament."

VOCATIONAL TRAINING IN NEW YORK STATE.

A vocational school will be opened in Buffalo, N. Y., in September with a capacity of fifty pupils. It will be arranged in accordance with the requirements of the State Department. There will be a room for woodworking and one for wood-finishing, also a room for drawing and academic work, which will take up half the school day.

After a careful study of the local factories in Rochester, N. Y., and an investigation of school conditions to ascertain how many boys fourteen years of age in the grammar grades would probably never enter high school, a tentative plan for a factory school was submitted to factory superintendents and to the



DINING ROOM FURNISHED AND DECORATED BY PUPILS OF THE SEVENTH AND EIGHTH YEARS. CRAFTS EXHIBITION, NEW YORK CITY BOARD OF EDUCATION, FEBRUARY, 1909.

Central Trades and Labor Council. This preliminary work resulted in the opening of the Rochester Factory School on December 1, 1908, with fifty boys in attendance. The work was carried on in an eight-room school building under the direction of two teachers, one a manual training teacher with some experience as a carpenter, the other a cabinet-maker from one of the factories. On February 1st, 1909, a department of mechanics and electricity was also opened with fifty more boys and two more instructors.

The aim of the school is to give the boys general industrial intelligence and some skill that will contribute to special trades. The present course is planned to cover two years and any boy fourteen years old or over may enter the school.

A week's work includes four hours of mathematics, five hours of drawing (mainly mechanical), three and one-half hours English, one and one-fourth hours spelling, and one and one-fourth hours industrial history and eighteen hours of shopwork.

The following general statements will show the scope of the work in the various subjects:

Mathematics.—Thoro review and drill on the multiplication tables, fractions, decimals, and decimal equivalents of work shop fractions; short methods of multiplication and division; rapid calculation, oral and written; measurements of all kinds, and all possible computations based on them; percentage in connection with measurements and comparisons of areas, volumes, weights, etc.; percentage as used in interest, bank accounts, discounts, taxes and insurance; powers and roots as used in common shop formulae; fundamental operations of algebra as employed in common shop formulae.

Drawing.—Correct use of materials and instruments; lettering; simple working drawings; geometrical problems; developments; working drawings and details; elements of mechanical perspective; principles of freehand perspective; model drawing.

English.—Thoro review of fundamentals of English grammar; letter writing of all kinds; making statements, invoices, checks, drafts, bills of lading, notes, etc.; five minute talks given by boys on industrial topics previously studied; compositions and short themes on industrial subjects.

Spelling.—Twenty-five words, daily, taken from industrial reports, trade magazines, etc.

Industrial history.—Present economic conditions and the industrial history of Germany, England, France and the United States; a study of the wage scale of the various occupations; a history of the lives of industrial leaders; a study of the city ordinances and state laws relating to industries; a study of the organization of various industries.

Shopwork in Wood-Working Department.—Simple cabinet-making, involving the fundamental principles of construction; use of stains, fillers and varnishes.

Shopwork in Department of Mechanics and Electricity.—Chipping and filing, and simple benchwork in metals; bell wiring, house wiring, fixture wiring, the taking apart and assembling, also the repairing of steam and gas engines; winding and wiring up of dynamos and motors, and the setting up of switchboards.

The list of models being turned out in the woodworking shop includes: Small looms, 10 in. x 12 in., for primary weaving; pillow looms, 24 in. x 24 in., for raffia work; drawing boards, drawing tables; bookcases and sewing boxes.

The foreman of the shop will supply the Board of Education with 120 sliding door book cases and with 300 sewing boxes for the grade rooms of the city. The boys work in groups under boy foremen, as follows: (1) Stock-cutting—getting out rough stock; (2) rough finishing—working stock down to finished sizes; (3) fine finishing—cutting of joints, boring for dowels, etc.; (4) assembling—gluing and clamping up the furniture; (5) cleaning up—sand papering and cleaning off the glue.

In the Department of Mechanics and Electricity the boys made the small metal fittings and castors needed for the bookcases made in the woodworking shop. The shop hours are from 8:30 A. M. to 3:00 P. M. with a half hour for luncheon. The school is open Saturday forenoons and will be in session during a large portion of the summer. In the school, shop methods rather than school methods are employed. Attendance and tardiness records are kept by the time card system. The advancement of the boys is determined by their skill in hand work.

An elementary factory school was started March 1st to fit boys to enter this factory school. It is expected that other elementary factory schools, a school of printing and a shop school for girls will be started in the very near future.

Roland Woodward, Superintendent of Mechanic Arts and Sciences of Mechanics' Institute at Rochester, N. Y., has resigned his position to become Secretary of the Chamber of Commerce in the same city. A. B. Fairbanks who has been in charge of the manual training department has been made superintendent of the combined departments. Another change in this school was made necessary by the election of Merritt W. Hayes to take charge of the industrial work in Newton, Mass. He is succeeded in the Mechanics Institute by N. A. Butz of Allentown, Pa.

Two new manual training schools have been opened in Greater Pittsburg the past year, one in the Sterrett Public School, East End Pittsburg, and the other in the Twelfth Ward School, Allegheny,

The industrial department of the Allegheney, Pa., High School is finishing the best year it has yet had. The work of the senior class was largely represented in the exhibit of the Eastern Manual Training Association.

Miss Alice West was recently elected dean of the Margaret Morrison School, Carnegie Technical Schools at Pittsburg.

SOUTH ATLANTIC STATES.

The manual training department of the Marion, S. C., graded schools has within the past year been placed on a permanent basis thru a first-class equipment given by citizens of the town. Several lathes are in use and it is the purpose of the Board to enlarge the shop and rooms for elementary manual training for next year. It has also been decided to employ a special teacher for this work in the colored schools.

SOUTH CENTRAL STATES.

Many of the schools for colored pupils in the south are doing excellent work along industrial lines and often with what would be considered inadequate equipment in other schools. In one of these, Knoxville College at Knoxville, Tenn., the boys are trained in various lines of woodwork and last summer they built a good sized library building of brick. The bricks were burned and laid by the boys. The industrial work of this school is in charge of Wm. Thos. Jones.

This is the first year that manual training has been taught in the schools of El Paso, Tex., and during this year four shops have been equipped for the boys' bench work, one room has been equipped with a large number of wood working machines, and three domestic science laboratories, eight equipments for sewing, and one model laundry have been installed. In addition to this, sand tables, looms, and all other necessary equipments for primary work have been installed. Equipments for work in cardboard construction, thin wood, clay, and basketry have also been provided. The laundry is in a school in the Mexican quarter, and has been very successful. Two more laundry equipments are to be installed for next year.

El Paso is a place of about 50,000 population. One part of the city is entirely of Mexicans, numbering about 10,000. The children are old for the grades in their regular studies, and the most of them leave school at about the fourth or fifth grade. The girls who are sufficiently large are being taught cooking, sewing and laundry work. To the boys suitable manual training is being given but they are hoping soon to build a trade school for them, in which shall be taught the trades which the boys are capable of learning.

OKLAHOMA.

The city of Muskogee is building a $2,000 high school building, which will have complete equipment for manual training. They are also building a commodious colored high school building which will be devoted to high school work with manual training a leading subject. Oklahoma City has put domestic science not only into the high school but into the seventh and eighth grades. They are also building a $25,000 high school building. The town of Wynnewood intends to put domestic science and manual training into the high school next year. Great progress has been made in the introduction of manual training, agriculture and domestic science in many of the public schools of the State. The town

of Garvin in McCurtain county is worthy of special mention. Many district schools in Blaine and Major counties have done considerable work in manual training.

Three of the State Normal Schools have put in domestic science in addition to manual training and agriculture, while three other State Normal Schools will establish domestic science and manual training chairs during the coming year. The State has established a manual training school for boys at Pauls Valley.

NORTH CENTRAL STATES.

The Cleveland Technical High School was dedicated on April 15th with appropriate ceremonies. In addition to the formal delivery of the keys, and music, addresses were made by Dr. Charles S. Howe, president of the Case School of Applied Science; Harry D. Thomas, Secretary of the United Trades and Labor Council; William H. Elson, Supt. of Schools and Samuel P. Orth, of the Board of Education. The school which is now completed and fully equipped is operating successfully with nearly seven hundred pupils enrolled. There is promise of an entering class for next year which will tax the capacity of the building to its limit. The Technical High School evening classes closed the second week in April; about 175 were enrolled in classes in mechanical and architectural drawing, design, pattern making, machine shop and domestic science. The admission to classes was limited absolutely to those actually at work during the day in vocations which the particular classes represented.

Judging from items in *The School Journal,* of Indianapolis, a publication devoted to the interests of the colored public schools, vocational schools are being established in that city and meeting with great success, especially with the colored pupils. Chair caning, shoe repairing, cooking for both boys and girls, basketry, apron making and fancy sewing are among the subjects that are being taught with a vocational end in view.

The contract for the new high school building at Grand Rapids, Mich., has been let for $258,750 and work on it is well under way. The contract specifies that all rooms requiring special equipment be ready by July 1, 1910. It is also planned to have the new $100,000 addition to the Union High School ready by that time. With this additional room and equipment it will be possible to give manual training courses extending thru the high school.

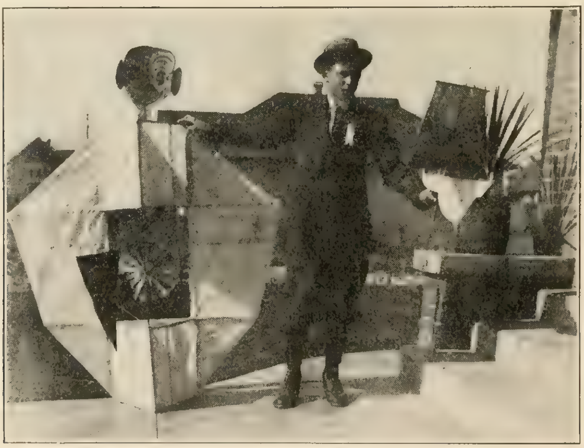
The Iowa Manual Arts Association has appointed a committee to make a collection of drawings for the use of teachers of woodworking. The plan is to secure from manual training teachers copies of the drawings of articles suitable for students to make in public school woodworking, especially such articles as are not generally familiar to teachers, and from these tracings will be made. These tracings will be sent out to members of the Association upon request and to others upon payment of a small expense fee. Blue prints will also be sold at cost to teachers desiring them. It is thought that such a collection of drawings, representing the ideas and experience of teachers who are in the work, will prove very helpful and suggestive to teachers. Any persons having

drawings that they are willing to have used for this purpose would help the work along by sending copies to R. C. Kelley, Supervisor Manual Training, Sioux City, Iowa.

The Nebraska Normal College at Wayne, Neb., is a private institution but was recently purchased by the State for a State Normal. The State will not, however, take charge for two years and until then it will be continued under private management. The work of the manual training department is under the direction of E. J. Huntemer and includes woodworking, foundry, forge work and mechanical drawing.

Clarence J. Smith, after being in charge of the manual training work in Wichita, Kan., for six years, is now at the head of that line of work at the Western State Normal School at Hays in the same State. B. E. Cannon succeeded him at Wichita.

After four years of manual training in the high school of Topeka, Kan., an examination of the record of students enrolled, shows that of the 1,007 students there recorded 712 were enrolled in Latin classes, 553 in manual training classes, and 412 in both Latin and manual training classes If the per cent of the student body enrolled in Latin classes is a good standard of measurement of the character of the high school and the calibre of its students, as many school men think, the Topeka school not only ranks high as a school, but by this same



WINDMILL KITE—TOURNAMENT OF 1909,
LOS ANGELES, CALIFORNIA.

standard, the mental calibre of the manual training students is shown to be not only above the average of that of the student body, but even above the average of that of the Latin students; for while the record shows that 55 per cent of all students were enrolled in manual training subjects, 58 percent of the Latin students were enrolled in some manual subject. A further investigation shows that 57 per cent of the E (excellent, highest mark given) Latin students were enrolled in manual subjects.

WESTERN STATES.

From a movement started six years ago by the ladies of the Monday Club in Prescott, manual training has extended to most of the principal cities of Arizona. Prescott, Phoenix, Bisbee, Douglas, and Flagstaff, all have growing departments. The Normal School at Tempe has a well equipped department under the supervision of A. B. Clark, formerly at Belvidere, Illinois. The Tempe Union High School is to have a large and well equipped department, and Tucson already has a fine new high school, which plans to make a strong feature of the industrial arts. Altogther the future for the extension of the work in the territory is bright.

Prescott, Ariz., has a flourishing department in manual and domestic arts. These branches have been a part of the public school system for five years. Some form of handwork is now given in all the grades from the third to the eighth. A beginning has been made toward an industrial course in the high school, and the first year work of such a course has been carried on during the past year. It is planned to install lathes and additional equipment this summer, making it possible to give a second year of this work during the coming year. The manual training in the high school and upper grades is in charge of Frederick Docker, formerly supervisor of manual training at East Chicago, Ind. The sewing and lower grade construction work is under the direction of Miss Ida Marshall, a graduate of Ohio State University.

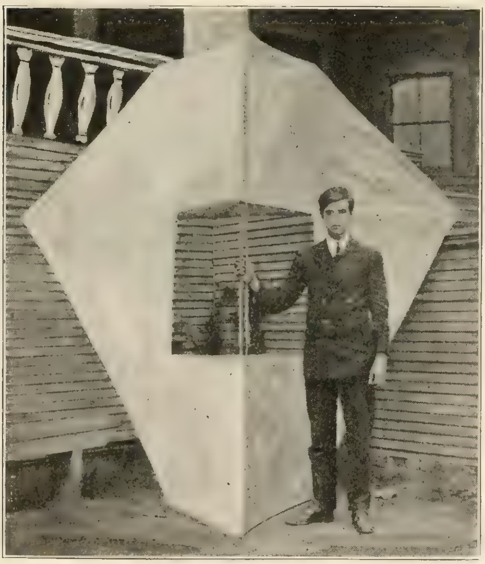

SECOND PRIZE, ARTISTIC KITE—TOURNAMENT OF 1909, LOS ANGELES, CALIFORNIA.

LOS ANGELES KITE TOURNAMENT.

The Third Annual Kite Tournament of the Los Angeles City School District was held April 3, 1909. It was a glorious day but the wind was quite uncertain, changing from a northerly direction in the morning to a southerly direction in the afternoon. The tournament began at about 2 o'clock; some of the boys brought their lunch and were on the grounds by eight in the morning. There was not sufficient breeze at the beginning to support the large kites and it looked quite discouraging, these kites only pulling about 2 lbs., but by three o'clock some of the kites began to break away and our fears were removed.

It was a magnificent sight when all the various creations of color, shape and energy were exhibited. The interest is ever increasing with both the children and the parents and a great assembly was present to witness the contest. Larger kites and more complex construction was attempted than heretofore. A good start was made on trussed construction and interest did not cease with the tournament. Many are planning to secure a prize next year. One kite had a windmill inside its frame which gave motor power to work a lever which caused a head to wag above the kite. One example of the sort is enough to start a whole new field of possibilities. Electricity will probably be used for a similar purpose next year. Simple diplomas stating the feat in which the contestant excelled were given to the victors. The diplomas were 5½ in. x 8½ in. printed with brown ink on a light tan paper.

A number of girls entered this year but do not like to compete with the boys except in artistic make-up and decorative features, so a number of feats exclusively for girls will be added next time. The small boy too is hard pressed and so a place will be given for fifth grade and under.



THIS KITE PULLED THIRTY-FOUR POUNDS, LOS ANGELES TOURNAMENT.

The spirit of the whole occasion was excellent—no bitter strife of one school with another—each child enthusiastic about the whole affair, and all the thousands of children, while excited, were genteel and happy.

Many a boy works on his kite for a month or more. At first, some of the members of the family will be very indifferent, but by the time the kite is finished, father, as well as the rest, is making suggestions, and they turn out in full force to see Bobbie win the prize. Sometimes the simpler kites with inexpensive materials are superior to the opposite. In nearly every case there is a very willing submission to the decision of the judges. In a race, one wins and the other must lose, so the children are learning valuable lessons for life in their own contests.

The larger boys try for the difficult feats of skill and strong pulling. Two kites seemed almost alike, but when the scales were applied one pulled 34 pounds while the other registered but 28 pounds. This comparison brought out further study in which it was found that one had a curve that the lighter puller did not have.

Only two yachts were in condition at the time for the race, then one of the kites kept breaking away so the one left made its ascent of 400 feet where the sail was tripped and the yacht spun down to its proud owner, making the round trip in about 2½ minutes.

Perhaps the most exciting feat was the quarter mile dash. Out of ten entries but seven started; the string was all measured and handed to the boys at the time for starting. Each boy was to start his kite, play out 1320 feet of string, and when it was all out he could attach it to a reel and wind it in as fast as possible. Each boy was entitled to one helper and they were timed by one of the judges. Policemen kept the crowd back from the lines. Very soon three kites were far in the lead, some getting mixed up, one failing to carry all the string, etc. See! one is at the end of his string and is winding in; now another is winding in; the third, soon after starting to wind in, catches his kite way out in yonder tree, and snap goes the string! The other two are working to their limit, one winding in a little over a yard at each turn; up the kites mount in the sky; now to this side, now to that; they are being pulled unmercifully. Now one is nearly overhead! Noisy? No; the excitement is too great to even yell. Here comes the first one right down with a bang on the heads of the spectators. It is not allowed to remain there, however, but is dragged right into the reel. The second follows hard after, and so the race is over. There was a prolonged yell about this time. Nat Stockwell of the Union Avenue School had won first place, and Elgin McNarry of McKinley Avenue second. The crowd about the boys shut off all breeze and to say that the boys perspired freely is putting it very mildly.

AN OLD BICYCLE BROUGHT INTO SERVICE IN THE LOS ANGELES TOURNAMENT.

A real glider was brought on by one of the boys; it was very interesting at the time, and also instructive for next year's construction. An attempt was made to glide for a short distance but a gust of wind caught the aeroplane and forced one corner to the ground, snapping off a post.

One event looked very serious for a time but had no serious consequences. A lad had entered the wireless competition and had laid good plans; he had aluminum wire for a conductor from his kite and had the ground wire attached to a water hydrant. A gust of wind, however, snapped his kite loose and let the wire drop across the trolley wire. When the kite broke loose he became confused and got tangled in his wire. The current was sufficient to stun him and he fell. As soon as he was removed, he revived and was taken home immediately. The boy claims he did not have any bad effects from the shock. This is reported that others may be cautious how they handle wire kite lines near trolley systems. The program of the tournament was as follows:

Group I.—a. Bird kite; b. Insect kite; c. Artistic kite; d. Best decorated kite; e. Animal kite; f. Man kite; g. Suspended figures; h. Star kite.

Group II.—a. Strong puller (over 3½ feet); b. Strong puller (under 3½ feet); c. Yacht race; d. Quarter mile dash; e. Parachutes; f. Kite antics; g. High flyer.

Group III.—a. Balloon ascension (endurance); b. Balloon ascension (beauty); c. Wireless operations; d. Photograph from kite; e. Dragon kites; f. Aeroplane as kite; g. Real glider.

Group IV.—a. Smallest plain kite; b. Smallest box kite; c. Quick construction of kite; d. Kites with moving parts; e. Best invention; f. Reels; g. Windmill kites.

A few of the winners are shown by the photographs, but the colors are missing, a very important feature in the kite's appearance. —CHAS. M. MILLER.

Manual training is now well organized from the first grade thru the high school in Helena, Mont. Work in the first grade includes paper folding, weaving on cardboard looms, cord work (knotting and braiding), wrapping of forms with raffia, tilo strands and cord and clay work; in the second grade cardboard construction, weaving, cord and raffia work, and clay work are given; in the third and fourth grades, the work is the same as in the second except that it is made more difficult; in the fifth, pamphlet bookbinding and sewed and woven reed and raffia baskets are given in addition to the cardboard construction and clay work; in the sixth grade, work in thin wood; leather work (modeling and embossing) and Venetian or bent iron work are given in addition to the clay work; in the seventh grade the boys begin bench woodworking and the girls are given sewing while in the eighth grade the bench woodwork is continued for the boys and the girls are given cooking.

The work is under the direction of J. W. Curtis, with Miss Grace Owen as supervisor of elementary manual training and Miss Mary C. Wheeler as supervisor of drawing and teacher of arts and crafts.

WINNIPEG.

Some months ago the Provincial Government appointed a commission to visit domestic science schools in many of the large centers of the United States and Canada. Their report has been received and the government is erecting a splendid building for this work in connection with the Agricultural College.

A domestic science center has been opened in the new King Edward school and two manual training centers have been opened, one in the Cecil Rhodes school, and the other in the King Edward. C. F. Fultz of Halifax, N. S., and R. B. Vaughan of Winnipeg are the new teachers.

A manual training center has been established at the Normal School. S. T. Newton is in charge of this department. In this center, in addition to woodwork, experiments are being tried with cement, copper, bookbinding, kite making, and basketry. In the latter the native reeds and rye straw are being utilized.

The work in clay modeling and carving in the junior grades has proved so suitable that it is being extended to two other schools, while in a third school whittling has recently been introduced.

It has been decided to give the new manual training high school a central location. The superintendent of manual training, W. J. Warters, is to be complimented on the rapid advance which manual training is making in Winnipeg. The Exhibition Association are giving $175 in prizes for manual training work.

ARTS CRAFTS—COLUMBUS, OHIO.

REVIEWS

Arbor Day Annual. Compiled by Harlan Hoyt Horner. Issued by the New York State Education Department, 1909.

This charming booklet will be an inspiration to every nature lover who turns its pages. It opens most appropriately with an introduction entitled "Nature's Gift to the Empire State," by the State Commissioner of Education, Andrew S. Draper. Then follow thirty pages of nature stories in prose, poetry, picture and song. "Caring for Trees," "The Brook," by Tennyson, "A Word to School Trustees" about attractive country school houses, "The Will of Charles Lounsbury," "Some Common Spring Flowers," "What Trees Do," "Woodman, Spare That Tree" by George Morris, and "The Pine," a song by R. Huntington Woodman, are among the titles. Several of those admirable illustrations in Hough's "Handbook of Trees of the Northern States and Canada," are included, and, best of all, "The Life Story of a Horse Chestnut Bud," illustrated with nineteen halftones arranged on a single folding sheet so that one can see at a glance just what took place in the development of the bud each day for the first eleven days from its start on the twenty-fifth day of March, and then its condition at interesting intervals till the first day of October when the burrs are open and the nuts ready to fall.

We wish that every elementary school in the United States could be provided with such a booklet each year. —C. A. B.

Mechanical Drawing Conventions. By L. L. Simpson, Central High School, Minneapolis, Minnesota. Published by the author, 1908. Price, 20 cents, postpaid.

These six cards about the size of postal cards form the most compact and convenient set of drawing conventions we have ever seen. It is surprising how much information of the most practical sort Mr. Simpson has been able to bring together on these cards. Moreover, the matter is admirably arranged and excellent in draftsmanship. The titles of the cards are as follows: (1) Lines and their use, (2) dimensions, (3) Gothic alphabet, (4) shading, (5) crosshatching, (6) method of showing breaks.

These cards were designed to fill a need in the Minneapolis schools, but their usefulness will extend far beyond the metropolis of the North.—C. A. B.

Handwork Construction. By Lina Eppendorff, Instructor in Pratt Institute, Brooklyn, N. Y. Published by the Author, 1908. 10 x 7 in.; pp. 125 including twenty-two pages of diagrams; price, postpaid, $1.58.

This book covers the problems in basketry, bead work and knotting given to first-year students of the normal art and manual training classes at Pratt Institute. The book deals with design as well as construction but the design is always based on construction.

Emphasis is placed on the importance of forming habits of thoughtful and accurate work as a foundation for true art and handicraft. The author would especially avoid giving any problems beyond the power of the child to do well. She says, "It should never be 'well done, considering the child's age,' but must be accepted because it is worth while in itself."

The book is most attractive, being well printed on a good quality of laid book paper with broad margins, and then bound in flexible boards covered with paper of a rich brown tone. The illustrations are excellent. —C. A. B.

Essentials of Descriptive Geometry. By J. D. Phillips, Professor of Drawing, University of Wisconsin, and A. V. Millar, Assistant Professor of Drawing, University of Wisconsin. 5 x 7½ in.; pp. 104.

In this book, the analysis of problems, and explanations are much abridged. Only the one analysis most easily understood is given to each problem. The figures are easily read on account of the different weights of lines, and the plain Gothic lettering. The figures are placed so as to be most convenient to the text. On account of the arrangement of the heavy type captions and subtitles it is easy to see the subject matter on a page at a glance.

The chief feature of the book is the problems. For each new principle presented there is a list of problems to be solved, bringing out its various applications. This covers half of the total space devoted to the subject. Besides these there are fifeen pages of original problems involving the practical application of descriptive geometry.

The book then is largely a list of problems with a concise, easily referred to explanation of the general principles involved in their graphic solution. It is especially valuable to teachers of descriptive geometry as a reference book.

—F. H. EVANS, Bradley Polytechnic Institute.

Woodworking. By R. B. Blackman, principal of Trade School, Provincial High School, Pangasinan, with drawings by Epifanio L. Villamil, instructor in drawing, Provincial High School, Pangasinan. Published by the Bureau of Education of the Philippine Islands, Manila, 1908. This manual of woodworking for Philippine public schools includes chapters on the shop outfit of tools; beginning the work, telling how to make a temporary equipment; shop management; the course of instruction, illustrated with working drawings; shop lessons on tools, woods, joints, etc.

Report of the Inspector of Technical Education, Ontario, Canada, 1909. By Albert H. Leake. A report of 168 pages containing over 130 illustrations, most of them halftones, showing nearly every phase of manual training and industrial school work, from dolls' furniture to a completely rigged sailing yacht, from a mass exhibit of woodworking models to a portable household science equipment for rural schools, or from a class in forestry in Abbottsholme, England, to a class in plumbing in St. Louis. Most of the illustrations, however, are of Canadian schools and Canadian school work. The text of the report is divided into (a) elementary handwork, (b) manual training, (c) vocational training for

elementary schools, (d) co-operation between school, factory and shop, (e) household science, (f) evening classes, (g) trade schools, (h) progress toward definite industrial training.

The Apprenticeship System in Its Relation to Industrial Education. By Carroll D. Wright. Bulletin No. 6 of the U. S. Bureau of Education, 1908. pp. 116.

This bulletin contains the results of an investigation undertaken at the instance of the United States Commissioner of Education, Dr. Elmer E. Brown. In the "Letter of Transmittal," Dr. Brown says:

"There can be no doubt that the desired combination of schooling and apprenticeship must be approached from many sides and will be accomplished in many ways. The treatment of apprenticeship presented by Colonel Wright describes certain ways in which this combination may be affected, as shown by recent experience in a few of our leading industries. It will throw light also upon the subject as a whole, and will doubtless be of value even in those undertakings in which the problem is approached by altogether different ways."

Industrial Education. January, 1909, number of the Annals of the American Academy of Political and Social Science, Philadelphia, Pa.; pp. 187; price, $1.00. This volume contains twenty-three articles by the leading American writers on industrial education. It opens with one on the "Relation of Industrial Education to National Progress," by Dr. Booker T. Washington. This is followed by articles on various phases of the subject by Carroll D. Wright, Dr. James P. Haney, Charles H. Morse, C. F. Perry, Charles F. Warner, Mary Schenck Woolman, Florence M. Marshall, John Wanamaker, John Golden, and others. The volume is a valuable summary of present thought on the subject.

Industrial Education. By Harlow Stafford Person. Published by Houghton, Mifflin & Co., Riverside Press, Cambridge, 1907. 5¼x8 in.; pp. vii + 86; price, cloth, $1.00.

This is an essay written upon the topic "What Method of Education is best suited for Men entering upon Trade and Commerce?" in the Hart, Schaffner & Marx series of Prize Essays on Economic Questions. It is an unusually clear, concise, and suggestive presentation of the problems of industrial education

The book is divided into two parts, The Need of a System of Industrial Education in the United States, and An Outline of the Proposed System of Industrial Education. The following is a good summary of the position taken:

"A general education, whose aim should be discipline and the development of character, should be pursued by all students *for as long a period as possible,* thereby developing the human-nature side and building the man before building the artisan and specialist; the varying financial circumstances of families, the varying dispositions of parents, and the varying mental abilities of youths, bring it about that in all stages of the educational system individuals are withdrawn to take up life's work; to promote industrial efficiency there should be at each stage of withdrawal industrial schools whose aim should be direct, and, in a

liberal sense, practical, technical training. This industrial training should not *be woven into the curricula of the general educational system,* should be separate, compact, and professional. The training of the man-side of the individual should not be impaired by injecting into it training for work; the training for work should not be weakened by having to carry the burden of training for culture.

"The system of industrial education as a whole should be flexible and rational. The technical training of any youth at any stage should be determined by his natural ability and his previous acquirements. The training of the earlier stages should be in the more general principles of business, and for the more general and less highly developed and specialized industrial functions; the training at the apex of the system should concern itself more deeply with the general principles of business, and should offer training for those functions demanding broad general knowledge and thorough technical knowledge of advanced and highly developed forms of business." —W. T. B.

Machinery's Reference Series. A series of pamphlets, each one a unit in a complete library of machine design and shop practice revised and republished from *Machinery.* Published by The Industrial Press, Publishers of *Machinery,* New York. 6 x 9 in., 32 to 48 pp. each; price, paper, 25 cents each to subscribers to *Machinery.*

Four of this series of handy manuals having to do more particularly with mechanical drawing are selected for notice at this time. In each case the text is fully illustrated with clear line drawings and diagrams. The teacher of mechanical drawing who wishes to know something of the practice in commercial drafting-rooms will find plenty of valuable material here.

No. 2. *Drafting-Room Practice* contains: Drafting-Room System, by R. E. Flanders; Tracing, Lettering, and Mounting, by I. G. Bayley; and Card Index Systems, by A. L. Valentine, J. S. Watts, and A. B. Howk.

No. 8. *Working Drawings and Drafting-Room Kinks* contains: Working Drawings, a discussion of arrangement of views, conventional lines, representation of screw threads, general principles of working drawings, etc.; Draftsmen's Tools, a description of the various tools and appliances of the drafting-room; and Drafting-Room Kinks, suggestions of various methods and appliances for saving time, solving difficulties, etc.

No. 9. *Designing and Cutting Cams* contains: The Drafting of Cams, by Louis Rouillon; Cam Curves, by A. B. Babbitt and F. H. Sibley; Notes on Cam Design and Cam Cutting, by J. L. Dinnany; and Suggestions in Cam Making.

No. 33. *Systems and Practice of the Drafting-Room* contains: Standard Drafting-Room Methods, by M. R. Kavanagh, E. W. Beardsley, W. E. Willis, and J. D. Page; General Sugestions in Making Drawings; and Drafting-Room Kinks. —W. T. B.

Elementary Knife Work, and Advanced Knife Work. By F. M. Mulford Richardson. Published by the Educational Publishing Co., New York and Chicago, 1906. 10½ x 9 in., 24 pp.

These are Nos. 5 and 6, for grades 5 and 6, of the "Practical Manual Training Series," by the same publishers. Each book presents a series of 16 models suitable for work in thin wood, using only pencil, rule, compasses, and knife. Each model is presented on a separate page with wash drawing and half tone, and the books are interleaved with blank paper for the pupil's working drawing of each model.

The book is intended to be placed in the hands of the pupils and contains directions for the making of each model. The list of models includes: key-tag, arrow, weaving needle, pencil sharpener, cake paddle, line winder, etc.

—W. T. B.

The following have been received:

Report of Commissioner of Education, 1908, *Vol. I.* Washington, D. C. The change in the color of the cover of this report from black to dull green is most agreeable. It is also agreeable to receive the commissioner's report within six months of the date on which it was sent to the Secretary of the Interior.

Education of Workers in the Shoe Industry. By Arthur D. Dean. This is Bulletin No. 8 issued by the National Society for the Promotion of Industrial Education, 546 Fifth Ave., New York City.

Report of Public Schools, Springfield, Illinois, 1907-8. This shows the rapid progress that manual training has made in Springfield and gives outlines of some of the courses. There are now twelve centers for woodworking for the seventh and eighth grades and an extensive equipment in the high school.

Course of Study in Industrial Art, Domestic Science and Manual Training. Public Schools, Columbus, Ohio, 1908-1909. This will be welcomed by supervisors who are of necessity interested in outlines of courses, time apportionment for each of the several grades, and the materials used.

The Art Craftsman. December, 1908. This is No. 3 of Vol. I of a monthly magazine of applied arts and industries, dealing with art metal work, enameling jewelry and allied crafts. It is published at 33 Furnival St., London, E. C., England. The number before us contains an illustrated article on "Metalwork for Churches," one on "Examples of Wrought Iron Work, 13th to 18th Centuries," and practical articles on "The Art of Chasing and Repoussé," "Metal Polishing without Steam Power," "Enameled Jewelry," and "Stained and Leaded Glass." It also includes notes on exhibitions, workshop hints, queries and editorials.

Evening Industrial Improvement Schools. By Arthur D. Dean. A bulletin issued by the Division of Trade Schools of the New York State Education Department, Albany, N. Y. This was written to stimulate the organization of the right kind of evening industrial schools. Mr. Dean has had much experience in such schools and his advice certainly ought to be sound.

The Present Status of Public Education. By Edward J. Goodwin. An address delivered at the University Convocation of the State of New York, Oct. 24, 1908. Published by the State Education Department, Albany, N. Y.

Agriculture and Its Educational Needs. By Andrew J. Draper, Commissioner of the State of New York. Published by the State Education Department, Albany.

The Journal of Home Economics. Vol. I, No. 1, February, 1909. Published bi-monthly by the American Home Economics Association, 30 Linden St., Geneva, N. Y., and edited by the secretary of the Association, Benjamin R. Andrews of Teachers College, New York City. This is a new journal of 111 pages, including the list of members of the Association.

The Nature-Study Review. Vol. V, No. 1, January, 1909. Contains several interesting articles on Industrial Education in Relation to Nature Study. Published at 30 Linden St., Geneva, N. Y.

The Survey. This is the new name given to that valuable publication—*Charities and the Commons*—published by the Charity Organization Society of the City of New York. In the future as in the past it will deal with problems social, charitable, civic. The first number under the new name—Vol. XXII, No. 1—contains articles by Jane Addams, Graham Taylor, Katherine Bement Davis and others.

Regulations and Syllabus of the Educational Handwork Association of England, John Cooke, Secretary, 4 Bloomsburg Square, London, W. C. This includes statements of requirements for examinations in clay-modeling, brush drawing, blackboard drawing, color work, paper cutting and mounting, cardboard modeling, woodwork, wood-carving, metalwork, school gardening and kindergarten handwork.

Prospectus of the Milwaukee School of Trades, 1909-1910, Charles F. Perry, Director. An attractive illustrated circular explaining the system of instruction, giving lists of equipment and outlines of courses.

Industrial Education in the Public School. By William C. A. Hammel, State Normal and Industrial College, Greensboro, N. C. A pamphlet containing an address delivered before the city superintendents and high school principals of North Carolina.

The Willow Basket. By William F. Hubbard, Farmers' Bulletin No. 341, U. S. Department of Agriculture, Washington, 1909. A forty-five page illustrated pamphlet on the culture of basket willow and the manufacture of willow ware in the United States.

The Repair of Farm Equipment. By W. R. Beattie. Farmers' Bulletin No. 347. U. S. Department of Agriculture, Washington. Suggestions concerning a farm shop, its equipment, and use.

Addresses and Papers, 1908-1909. By Andrew S. Draper. Published by the New York State Education Department, Albany. Twelve addresses, including "From Manual Training to Technical and Trade Schools," and "The Adaptation of the Schools to Industry and Efficiency."

Report of Superintendent of Public Schools, Allegheny, Pa. 1909. Contains outlines of the courses in manual training.

School Gardening and Nature Study in English Rural Schools and in London. By Susan B. Sipe. Bulletin No. 204, Office of Experiment Stations, Department of Agriculture, Washington, D. C.

WORK OF STUDENTS OF THE ARTS CRAFTS SCHOOL, [illegible] SEE ALSO PAGES [illegible]